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**THE IMPACT OF AN ELECTRONIC
BENEFIT TRANSFER SYSTEM IN
THE FOOD STAMP PROGRAM**

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EXECUTIVE SUMMARY

As part of a general effort to improve the efficiency and integrity of food stamp issuance and redemption, the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture tested an electronic benefit transfer (EBT) system. This system eliminates food stamp coupons; instead, benefits take electronic form. Recipients use magnetic-stripe cards to buy food, and computers debit and credit grocer and household accounts.

In July 1983, FNS awarded a contract to Planning Research Corporation (PRC) to design and test an EBT system on a demonstration basis in Reading, Pennsylvania. The system began operating in October 1984. It served an average food stamp caseload of about 3,400 households, who made over 25,000 electronic food purchases in about 125 retail food stores each month. The demonstration ended in December 1985. The Pennsylvania Department of Public Welfare (PDPW) then assumed responsibility for operating the system.

In parallel with the demonstration contract, FNS awarded a contract to Abt Associates, Inc. to evaluate the demonstration. The evaluation's main objective is to compare the EBT system to the coupon-based issuance and redemption procedures previously followed in Reading. The evaluation measures the difference between the two systems in terms of their administrative cost, their vulnerability to benefit loss and abuse, and their impacts on participating food retailers, recipients, and financial institutions. This report addresses those issues.

OVERVIEW OF THE ATP/COUPON SYSTEM

The EBT system replaced a system in which food stamp recipients receive their benefits by means of Authorization-to-Participate documents (ATPs) and food stamp coupons. Each month the State mails food stamp households an ATP authorizing an amount of benefits for the month. The recipient takes the ATP to a bank, presents it along with appropriate identification to a teller, and is given the specified amount of food stamp coupons. Coupons come in denominations of \$1, \$5, and \$10, and are assembled in books of \$2, \$7, \$10, \$40, \$50 and \$65.

Recipients may use the coupons to buy eligible food items at any food retail establishment authorized to participate in the Food Stamp Program. The retailer endorses the coupons and deposits them at the bank. The bank credits the retailer, cancels the coupons, and sends them on to the appropriate Federal Reserve Bank. The Federal Reserve Bank credits the local bank and destroys the coupons.

OVERVIEW OF THE EBT SYSTEM

In the EBT system, the recipient has a magnetic-stripe plastic card and a computerized account at the EBT Center. Food stamp applicants receive the card, along with training in how to use it, when they are certified eligible for benefits. Benefits are electronically deposited in each household's account. Once benefits are posted to accounts, recipients may use them to buy food in any store participating in the demonstration.

All retailers authorized to participate in the Food Stamp Program and located within a five-mile radius of central Reading were eligible to take part in the demonstration, and virtually all of them did. Each checkout counter was equipped with a terminal. To buy food with EBT benefits, the recipient presents the EBT card to the cashier, who passes it through the terminal's card reader. The recipient then keys in a four-digit secret identification number, and the cashier enters the amount of the purchase. The terminal makes a dial-up connection with the EBT Center computer, which checks the recipient's account, debits it for the amount of the purchase, credits the grocer's account, and sends an authorizing message back to the store terminal. The terminal prints a receipt for the recipient showing the purchase amount and the remaining balance in the food stamp account.

Once a day, the EBT Center runs a program to total all retailer credits. Center staff then initiate an electronic funds transfer process, using the Automated Clearing House system operated by the Federal Reserve. Grocers' accounts are credited for their food stamp sales the following day.

OVERVIEW OF THE EVALUATION

The evaluation obtained extensive data about both the ATP/coupon system and the EBT system. Data collection occurred in three main periods: the late summer of 1984, just before the EBT system began operating; early in

1985, when the system had operated 3-6 months; and late in 1985, after about a year of operations. The latter two data collection waves obtained information about both the EBT and the ATP/coupon system, allowing both a before-after and a side-by-side comparison.

Each major research topic involved a different set of data sources. Key topics and sources include:

- Administrative costs -- Interviews and accounting record reviews; time studies in local welfare office and EBT Center.
- Vulnerability to benefit loss and diversion -- Food stamp reporting systems; interviews with food stamp officials and outside experts in electronic funds transfer issues.
- Effects on retailers -- Six waves of interviews with participating grocers; three time studies of checkout procedures in 30 participating stores and 10 comparison stores.
- Effects on recipients -- Three waves of interviews with about 280 demonstration recipients and an equal number of comparison recipients; two waves of interviews with 170-260 households whose cases had recently been closed.
- Effects on financial institutions -- Three waves of interviews with participating commercial banks and the Federal Reserve Bank.

This highly diverse research strategy provides a rich base of information about the demonstration EBT system, and multiple perspectives on its effects. The central findings are summarized below.

The EBT system is operationally feasible.

The demonstration EBT system worked, and people who dealt with the system received it warmly. This result was evident quite apart from the analyses described in the present report. Recipients are able to buy food with their food stamp benefits, and grocers are credited. Some problems occurred, but the various parties to the demonstration considered the system successful enough to extend its life beyond the scheduled end of the demonstration.

EBT demonstration costs far exceed ATP coupon costs.

Operating costs of the EBT system during the demonstration dramatically exceed the costs of the conventional ATP/coupon system. Total administrative costs for issuing and redeeming benefits under the ATP/coupon system are estimated at about \$3 per case per month. Equivalent costs for the EBT system are nine times greater, at about \$27 per case month. This estimate excludes the cost of developing and implementing the EBT system, which amounted to \$2.3 million.

Administrative costs are examined in terms of five major issuance and redemption functions: authorizing benefits, delivering benefits to recipients, crediting retailers, managing retailer participation, and reconciliation and monitoring. EBT costs are substantially larger than ATP/coupon costs in all five areas. The difference is greatest for the benefit delivery and reconciliation functions, where high fixed costs in the EBT system are averaged over a relatively small caseload. ATP/coupon costs may be somewhat lower in Pennsylvania than elsewhere, because the Pennsylvania system appears quite streamlined, but even a substantial percentage adjustment to the ATP/coupon cost would not change the basic finding.

Equipment and personnel at the EBT Center and terminals in retail stores make up the bulk of the EBT system costs. In the ATP/coupon system, the single largest expense is the payment to issuance offices.

EBT operating costs can be substantially reduced.

Several characteristics of the demonstration caused EBT costs per case month to be higher than would be expected in a permanent system. The most important factors were the small caseload and the stand-alone character of the system (which prevented economies of scale); leasing rather than purchasing equipment; and the need for more highly skilled (and paid) staff than a routine operational setting would demand.

In a permanent, non-demonstration EBT system, two factors have a critical impact on average operating costs. The first is the cost of maintaining the recipient and grocer files, authorizing transactions, and reconciling and monitoring the system -- functions the EBT Center carried out in the demonstration. These costs are largely fixed, and must be spread over a large number of households and transactions for the average cost to reach

economical levels. One strategy, which Pennsylvania plans to implement, is to integrate the EBT system with the large computer operation supporting the Food Stamp Program and other programs administered by the Department of Public Welfare. Thus, even though the scale of the EBT system itself may be limited, the central processing costs can be amortized over a larger transaction volume.

The second critical factor is in-store terminal costs. These depend not only on the equipment's price, lifetime, and maintenance needs, but also on the number of terminals required to serve the food stamp caseload. The ratio of households to terminals is determined by the caseload and the number and size of participating stores in an EBT area. The Food Stamp Program cannot influence the ratio much, unless it restricts the number of terminals per store or the number of stores allowed to participate in the program. "Piggybacking" EBT with commercial point-of-sale systems could be an effective strategy for managing terminal costs, however. With piggybacking, the cost of at least some terminals in the EBT system would be shared with other users. Operators of commercial systems would welcome the piggybacking, because it would increase their transaction volume and reduce average costs.

A permanent EBT system operated on a larger scale would clearly have lower unit costs than those observed in Reading. Whether the costs of such a system could reach the \$3 ATP/coupon cost is less clear. Costs are projected for several scenarios, some involving the integration of central processing operations and some involving piggybacking with commercial systems. All but one of the scenarios have costs exceeding \$4.50 per case month, not counting development costs. The only scenario yielding costs under \$3 assumes that all retailers accepting food stamps participate in commercial point-of-sale systems, an assumption that is unlikely to be met in most areas for the next few years.

The projections cannot be taken as conclusive evidence that EBT costs will always exceed ATP/coupon levels. They do not attempt to predict, for example, how quickly the costs of equipment and software will decline or what cost-sharing arrangements might be negotiated. The extended EBT demonstration in Pennsylvania may shed light on some of these issues.

Administrative cost is in any case only one dimension on which the

Stamp Program's integrity and on the program's various participants. These issues are discussed below.

An EBT system may reduce benefit loss, but large savings are unlikely.

In discussing the value of error, fraud, and abuse associated with the issuance of food stamp benefits, it is important to distinguish between problems resulting in actual losses (i.e., extra costs to the taxpayer), and problems which divert benefits from their intended use without adding to program costs. If someone steals a recipient's ATP, the Food Stamp Program will replace it; if both the recipient and the thief use the ATPs to get coupons, program costs increase. On the other hand, if someone steals the recipient's coupons, the program does not replace them. The benefits fail to serve their intended purpose, but program costs are not affected.

Actual benefit losses in the ATP/coupon issuance system are estimated to amount to about one tenth of one percent of all food stamp benefits issued, or about \$0.13 per case per month. These figures are approximations based on FNS reports and experts' judgments. Even if very substantial adjustments were made to the estimates, however, the losses would remain quite small compared to the administrative cost figures discussed above.

No significant losses were discovered in the EBT demonstration, but the demonstration was not expected to provide a realistic picture of long-term losses. Losses under a non-demonstration EBT system are projected at \$0.03 per case per month. This substantial reduction from the ATP/coupon estimate would come mainly from eliminating losses during the production and handling of food stamp coupons.

The estimate of EBT losses is based on the opinions of individuals familiar with security issues in the Food Stamp Program and/or electronic funds transfer systems. Without "hard" numbers, one must be cautious in drawing conclusions about how much -- or whether -- an EBT system will reduce benefit loss. The experts' belief in such reductions is important in itself, however, suggesting that an EBT system could enhance public confidence in the Food Stamp Program's integrity.

An EBT system limits the diversion of benefits from their intended uses.

As much as \$4 in coupon benefits per case month, or 3 percent of total food stamp benefits, may not serve the purpose of helping recipients buy authorized food items. The EBT system is estimated to reduce this potential diversion to just over \$1 per case month.

The EBT system's largest estimated impact on benefit use does not involve fraud or abuse. A recipient may get up to \$0.99 in cash change from a food stamp coupon purchase. Based on average spending patterns, this feature of the coupon system may allow about \$2.49 per case month to be spent on non-food purchases. The EBT system deducts the exact value of a purchase from the recipient's account, giving no cash change, thereby redirecting all or nearly all of these benefits to food purchases.

The EBT system also provides greater security for the benefits in recipients' possession. The value of lost or stolen coupons is estimated at \$0.79 per case month, based on recipient survey data. Recipients reported that equivalent losses under the EBT system were \$0.24 per case month.

Retailers prefer the EBT system, though its financial impact is small.

Despite initial concerns that many retailers might choose not to participate in the EBT demonstration, virtually all eligible stores participated. In fact, the retailers actively supported the effort that resulted in extending the life of the EBT system past its scheduled termination date.

Retailers expressed strong preferences for the EBT system over coupons almost from the beginning of the system operations. The last survey, near the end of the demonstration period, found 66 percent preferring the EBT system, compared to 20 percent preferring coupons. Supermarkets and convenience stores were somewhat more positive than the smaller grocery stores, but the preference margin was over three to one in all store groups.

The retailers' main reason for preferring EBT is that it reduces the irritating post-sale handling effort required for coupons. They also value what they perceive as substantial reductions in fraud and abuse with EBT, and not having to give cash change for food stamp transactions.

The EBT system reduces retailers' costs of participating in the Food Stamp Program. Its more limited handling requirements more than offset the somewhat longer checkout time with EBT transactions and the cost of space for the EBT equipment (equipment and communications were provided at no cost to the retailers). Participation costs are estimated at \$18 per \$1000 of food stamp coupons redeemed, compared to \$13 per \$1000 of EBT benefits. Although the percentage difference is substantial, it translates into savings of only \$14 per month for the average store in Reading. Not surprisingly, then, most retailers felt the EBT system made no difference to their overall operating costs or profits.

Recipients strongly prefer the EBT system and experience lower participation costs.

About 77 percent of surveyed recipients prefer the EBT system to coupons, compared to 17 percent preferring coupons. Groups that were expected to find it hard to cope with the sophisticated system -- the elderly, the handicapped, non-English speakers, and recipients with little education -- also strongly favor the EBT system. In no demographic group do fewer than 70 percent prefer the EBT system.

Recipients believe that the EBT system is easier to use than the coupon system, particularly in the retail store. A routine EBT purchase requires only that the recipient hand over the EBT card and key in a four-digit number. With coupons, the recipient has to select an appropriate number of coupon books to match the purchase amount and tear out individual coupons when the books do not match the sale amount exactly.

The EBT system reduces the time and money recipients spend to participate in the program. Obtaining benefits and dealing with problems is estimated to take about 48 minutes of the average recipient's time per month in the ATP/coupon system, and to entail an average expenditure of \$2.21. The EBT system requires only 12 minutes and a \$0.26 expenditure. Much of the difference occurs because coupon recipients have to go to the bank each month to exchange their ATPs for coupons, while EBT recipients need only an initial visit to the welfare office to get their card. In addition, the value of coupons lost and stolen from recipients is substantially above the value of comparable EBT losses.

Banks strongly prefer the EBT system and experience lower redemption costs.

Local banks play two roles in the ATP/coupon system in Reading. They act as issuance agents, giving recipients coupons each month when they bring in their ATPs. The banks also accept food stamp coupon deposits from retailers, crediting the retailers and passing the coupons on to the Federal Reserve to get credit themselves. Their main role in the EBT system is to accept electronic deposits to the retailers' accounts (one bank also initiates the electronic funds transfer actions).

Although the banks receive fees for their issuance role, and estimates indicate that the fee at least covers their operating costs for the service, they are extremely pleased to have the issuance role eliminated. They see issuance as detracting from their branches' ability to conduct the banks' main business.

The EBT system substantially reduces the banks' estimated costs of handling and redeeming food stamp benefits, for which they receive no direct compensation. Costs were estimated at \$5.96 per \$1000 in benefits redeemed in the ATP/coupon system, compared with \$0.40 per \$1000 with EBT.

The EBT system also reduces operating requirements at the Federal Reserve Bank, from receiving and destroying coupons to handling electronic funds transfers. Estimated operating costs are \$0.75 per \$1000 of coupons redeemed, compared with \$0.24 with the EBT system. Because the Federal Reserve is compensated for both services, it is not affected financially by the operating difference between the systems.

CONCLUSION

Like most demonstrations, the Reading EBT test answers some questions while leaving others unresolved. Most importantly, it shows that the requisite technological and human factors can be put together to make an Electronic Benefit Transfer system operate effectively in the Food Stamp Program. A small-caseload test, however, cannot be expected to produce definitive answers on the cost-effectiveness of a system so dependent on economies of scale. Cost-effectiveness therefore remains the critical unanswered question.

From all points of view except administrative cost, the demonstration EBT system in Reading appears preferable to, or at least comparable to, the conventional system using ATPs and coupons. Exhibit 1 summarizes the findings. Recipients, grocers, and bankers all strongly favor the EBT system. The EBT system seems capable of reducing the potential for benefit diversion, as well as some benefit losses due to error and fraud.

Despite these positive results, EBT administrative costs in the demonstration were so much higher than ATP/coupon costs that major changes would be necessary for EBT costs to reach acceptable levels. The best hope involves integrating the EBT system with other operations to achieve some economies of scale and cost sharing. These are realistic possibilities, as indicated by the integration of EBT with other assistance program functions in the extended demonstration, and by the rapid development of commercial point-of-sale systems. It will therefore be important for future research on EBT applications to give highest priority to the issue of costs.

Exhibit 1

Summary of the EBT System's Effects

	ATP/Coupon System	EBT System
Administrative cost per case month	\$2.92	\$27.23
Benefit losses per case month	\$.13	\$.03
Benefit diversions per case month	\$3.97	\$1.13
Retailers' participation cost per \$1,000 of benefits redeemed	\$17.74	\$13.22
Recipients' time spent (in minutes) per case month	48	12
Recipients' expenditures per case month	\$2.21	\$.26
Banks' uncompensated costs per \$1,000 of benefits redeemed	\$5.96	\$.40

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Chapter One

INTRODUCTION

The Food Stamp Program provides benefits to needy households to help them purchase food. Households receive the benefits in the form of food stamp coupons, each of which has a face value - for example, five dollars. Recipients use coupons, as they would use cash, to buy groceries at any authorized food retail outlet. These outlets include nearly all food retailers in the country.

The U.S. Department of Agriculture, Food and Nutrition Service (FNS) administers the Food Stamp Program. For several years, FNS has sought alternatives to the current systems that are more efficient, less costly to administer, and less vulnerable to fraud and abuse than the most frequently used coupon systems.

One alternative approach uses electronic funds transfer (EFT) and point-of-sale (POS) technologies to issue and redeem food stamp benefits.¹ In 1983, FNS funded a demonstration to test this approach. The demonstration involved developing an Electronic Benefits Transfer (EBT) system and operating it as part of the Food Stamp Program in Reading, Pennsylvania. The system began operations in October 1984. The demonstration was scheduled to end in December 1985. Because nearly all participating parties responded very warmly to the EBT system, FNS and the State of Pennsylvania arranged to extend the demonstration, with the Pennsylvania Department of Public Welfare assuming responsibility for system operations.

FNS funded evaluations of both the original and the extension phases of the demonstration. This report presents evaluation results for the original demonstration. The evaluation compares the demonstration EBT system to the coupon system in terms of administrative cost, vulnerability to fraud and abuse, and the systems' effects on grocers, food stamp recipients, and banks. This report presents the main results of the evaluation.

¹A glossary of terms and abbreviations used in this report is included as Appendix I-B (p. I-4).

THE EBT DEMONSTRATION

In January 1983, FNS solicited proposals from independent contractors to design, develop, and pilot test an Electronic Benefit Transfer system. The solicitation did not specify where the system should be tested or how it should be designed, but it contained a lengthy statement of functional requirements that any proposed system had to meet. Prospective contractors had to submit a preliminary system design. They also had to select a test site and show evidence that the State and local food stamp agencies, local food retailers, and local financial institutions would cooperate in the test.

Planning Research Corporation (PRC) won the competition, and in July 1983, FNS awarded PRC the contract to carry out the demonstration in Reading, Pennsylvania. PRC proposed an on-line, direct debit system, in which a recipient's food purchase would involve automated communication with a central computer to deduct the amount of the purchase from the individual's food stamp account.

The ATP/Coupon System. The food stamp issuance system that existed in Reading before the demonstration uses Authorization-to-Participate (ATP) documents and food stamp coupons. Each month, food stamp recipients receive an ATP in the mail indicating their food stamp allotment for the month. They take the ATPs to local bank branches and exchange them for the appropriate amount of coupons. Recipients then buy food with the coupons at retail food stores. The retailers, in turn, deposit the coupons at local banks, which pass them on to the Philadelphia Federal Reserve Bank for credit.

The EBT System. In the EBT system, recipients have a plastic, magnetic-stripe card (like a bank debit card) and an account at the EBT computer center. Recipients' benefits are electronically added to their accounts each month. PRC installed terminals at the checkout counters of all participating stores, and recipients can use their EBT card to buy food at any store with terminals. When a recipient makes a purchase, the computers at the EBT Center automatically debit the purchase amount from the recipient's account and post a corresponding credit to the grocer's account. At the end of each banking day, the EBT Center initiates an electronic funds transfer process to deposit funds for recipients' purchases into grocers' bank accounts.

Participants in the Demonstration. The Berks County Assistance Office (BCAO) administers the Food Stamp Program in Reading, which is the largest city in the county. About 5,300 households in Berks County received benefits each month during 1984-85. Because the original solicitation specified that the demonstration would involve no more than 4,000 cases, only those food stamp recipients living in the four central ZIP code areas of Reading participated in the EBT system. This area had a caseload of about 3,400 households, all of whom were placed on the EBT system. The remaining 1,900 food stamp cases continued to use the ATP/coupon system during the demonstration.

All food retailers operating within a five-mile radius of central Reading were allowed to participate in the EBT system. Participation was not mandatory. Retailers could refuse the EBT equipment and still continue to accept food stamp coupons, but they would not be able to make food stamp sales to the demonstration recipients, who no longer had coupons. Virtually all eligible retailers participated. About 125 retailers made EBT sales in any given month. Because of store turnover and the participation of some stores with little food stamp business, the number equipped at one time or another during the demonstration totaled 162.

Chronology. PRC began elaborating the EBT design in July 1983, immediately upon contract award. Recipients first used the system 15 months later, in October 1984. About 100 stores were equipped and operational at that time. Recipients were phased onto the system, with February 1985 the first full month of operations with the entire demonstration caseload.

The EBT system successfully performed its basic functions -- issuing benefits, authorizing purchases, and crediting retailers -- from the beginning. During the first few months, however, a number of system failures and slowdowns occurred. These were due, in part, to several factors: underestimating the number of transactions the system had to process and store; hardware and software choices that limited processing speed; and the minor "bugs" and operator error common in new systems. During the late spring and summer of 1985, PRC modified a number of system features. System performance is viewed as having stabilized at an improved level by about August 1985, and continued at that level through the end of the year.

The original plan called for the demonstration to end in December 1985, and for Reading recipients and grocers to return to the ATP/coupon system. Because the EBT system was widely seen as successful, however, the Pennsylvania Department of Public Welfare (PDPW) asked FNS to continue operating the EBT system. The participating retailers, through their statewide trade organization, lobbied in support of this request. Pennsylvania's Governor and Congressional delegation also expressed strong support. FNS and PDPW ultimately worked out an arrangement extending the demonstration, with PDPW taking over PRC's responsibility for operating the EBT system.

THE EVALUATION

At the same time FNS was deciding on a demonstration contractor, the agency solicited proposals to evaluate the demonstration. Abt Associates Inc., with Bank Earnings International as a subcontractor, was awarded the evaluation contract in July 1983.

The evaluation was designed to answer a variety of questions in five major areas, summarized below:

- Administrative cost -- Were the costs to the government of operating the EBT system greater or less than those of the conventional ATP/coupon system? If EBT costs were higher during the demonstration, would they be expected to decline to the ATP/coupon level in a non-demonstration application?
- Benefit loss through error, fraud, and abuse -- Does the EBT approach reduce the Food Stamp Program's vulnerability to loss or misuse of benefits? What values of loss and misuse might be expected in the ATP/coupon and EBT systems?
- Impact on participating food retailers -- Did the EBT system raise or reduce the costs retailers incur to participate in the Food Stamp Program, compared with the coupon system? How did it affect checkout productivity, handling costs, and other cost elements? Which system did retailers prefer, and why?
- Impact on recipients -- Were recipients able to cope with the requirements of the electronic system? Which system did they prefer? Did the EBT system change the amount of time and money recipients spend to participate in the Food Stamp Program?

- Impact on financial institutions -- How did the EBT system affect the participating local banks, particularly in terms of the handling costs and "funds float" associated with food stamp redemptions? Which system did the banks prefer? How did the EBT system change the role of the Federal Reserve Bank in the Food Stamp Program?

These major questions about the impact of the EBT system relative to the ATP/coupon system are addressed in this report. The evaluation has produced two prior reports addressing issues in the design, implementation, and performance of the EBT system. The evaluation will also produce a review of EBT system security, an analysis of recipients' shopping patterns, and an examination of EBT impacts on existing administrative procedures and regulations in the Food Stamp Program. Appendix I-A (p. I-3) identifies the various evaluation reports.

Evaluation Design. The evaluation was built around three major waves of data collection. The Pre-Demonstration wave occurred in July-September 1984, shortly before the EBT system was implemented, and provided baseline measures of the ATP/coupon system. The Early Demonstration wave was carried out in February-April 1985, just after the EBT system began operating with the full recipient caseload. This was the period in which the system's operating problems were generally considered most severe. The Late Demonstration wave took place in August-November 1985, during the period of stabilized operations.

The evaluation used a wide variety of data sources, including existing records systems and special surveys. Wherever possible, the evaluation examined the ATP/coupon system as well as the EBT system in the demonstration waves. For example, a comparison group of recipients was defined, consisting of food stamp households living just outside the demonstration area, and samples of these households were surveyed when we surveyed demonstration recipients. Checkout counter time studies were carried out in stores in nearby Allentown, Pennsylvania, as well as at the demonstration stores in Reading.

The evaluation was designed to allow the strongest possible conclusions about the effects of the demonstration. Some limitations must be considered, however, when addressing the more general question of whether an

EBT system is desirable for the Food Stamp Program. Most importantly, the demonstration represents only one possible version of an EBT system, and it was carried out in a single location. A different system, or even the same system in a different setting, might not have exactly the same results. Another key caveat concerns the Reading system's experimental, "first of its kind" nature; this clearly influences the system's costs, and perhaps other outcomes as well. Other limitations, applying to particular analyses, are noted in the report.

The primary effects of the demonstration EBT system are quite clear in the evaluation results, however. The findings should therefore form a solid foundation for future research and policy decisions about using electronic funds transfer technology in the Food Stamp Program.

Chapter Two

OBJECTIVES AND FEATURES OF FOOD STAMP ISSUANCE SYSTEMS

This report compares two food stamp benefit issuance systems. The first is the conventional issuance system in place in all of Berks County prior to the demonstration and during the demonstration for food stamp recipients not included in the demonstration. This system uses Authorization-to-Participate (ATP) cards to authorize the disbursement of food stamp coupons to recipients. The new demonstration system is the Electronic Benefit Transfer (EBT) system, which electronically places benefits in recipients' accounts, and allows recipients to use plastic cards to spend their benefits at grocery stores.

2.1 CHARACTERISTICS OF FOOD STAMP ISSUANCE SYSTEMS

ISSUANCE SYSTEM OBJECTIVES

A food stamp issuance system must deliver a monthly allotment of benefits that recipients can use to buy food. These benefits must be usable at any retail establishment authorized to participate in the Food Stamp Program. Recipients must be able to use their benefits without experiencing discrimination -- that is, authorized retailers must treat food stamp customers in the same manner as other customers. They must not, for example, designate any checkout counters for food stamp customers only or require that food stamp customers shop during prescribed hours.

Beyond this fundamental requirement, a food stamp issuance system must pursue several collateral objectives. For example, it must minimize opportunities for fraud and abuse. This typically involves incorporating mechanisms to ensure that benefits move securely from the state agency to authorized recipients. It also entails tracking lost or stolen benefits. Once recipients receive their food stamp benefits, the system must provide controls to ensure that these benefits are used to purchase authorized food items.

Another objective is to minimize the administrative costs of providing benefits to recipients. Because state governments must pay a portion of these administrative costs, it is to their advantage to choose the issuance system that delivers benefits in the most cost-effective manner.

Finally, an issuance system must be designed to minimize negative impacts on participating retailers, financial institutions, and food stamp recipients. Retailers and financial institutions play critical roles in the conversion of program benefits into food. If the issuance system imposes substantial costs, or hinders normal operations, retailers and financial institutions might not participate in the Food Stamp Program. Similarly, if recipients have to invest substantial time or money to collect and use program benefits, they may be unable to participate in the program, defeating its intended purpose of providing assistance to needy households.

EXISTING ISSUANCE SYSTEMS

State food stamp agencies may exercise considerable discretion in devising a benefit delivery system to meet the objectives described above. As a result, five major kinds of issuance systems have evolved:

- ATP system. The Authorization-to-Participate system is used by 31 states (either exclusively or in conjunction with other systems), and delivers approximately 43 percent of all program benefits nationwide.¹ Recipients get an ATP card in the mail each month, and use it at issuance offices to obtain their monthly allotment of food stamp coupons.
- Direct mail. The second most common issuance system, direct mail, accounts for 31 percent of all issued benefits. Food stamp coupons are mailed directly to recipients each month.
- On-line. Recipients present identification cards to an issuance agent. The agent verifies the authorization through direct access to a computerized allotment file, gives recipients their monthly allotment of food stamp coupons, and records the transaction on the computerized file.

¹USDA, Food and Nutrition Service. Food Stamp Program Issuance Information, 1986.

- Direct delivery. ATPs are mailed to issuance agents. Recipients present their identification cards to the issuance agent, sign the ATP, and receive coupons.
- HIR system. In this completely manual system, a paper Household Issuance Record is maintained at an issuance office (usually the local welfare office). Recipients present their identification cards, sign the household issuance record, and receive coupons.

All five systems rely on food stamp coupons as the medium of exchange. A sixth system, which issues program benefits in cash, is used in Puerto Rico; it is also used for elderly Supplemental Security Income recipients in a few sites.

The ATP system used in Reading before the demonstration cannot be seen as representing all coupon-based issuance systems, but it is an example of the most widely used system. The next section describes the Reading system in somewhat more detail.

2.2 THE ATP/COUPON SYSTEM IN BERKS COUNTY

The main organizations participating in the food stamp issuance system in Reading are the Pennsylvania Department of Public Welfare (PDPW), its local agency, the Berks County Assistance Office (BCAO), local banks, and food retailers. Banks act as issuance agents. Clients redeem their ATPs at these banks and can exchange their food stamp coupons for food at over 240 participating retail food outlets in Berks County, or at any other participating establishment in the United States. The Mid-Atlantic Regional Office (MARO) of the Food and Nutrition Service, the Philadelphia Federal Reserve Bank, and various units of FNS at the national level play smaller roles.

AUTHORIZING CLIENTS TO GET BENEFITS

Under the ATP/coupon system, the state welfare department authorizes a certain amount of benefits for each recipient each month. This involves three steps: placing Household Issuance Record data and current issuance authorization information on the Food Stamp Master File, printing ATP cards, and distributing ATP cards. In Berks County, ATP cards are mailed directly to recipients.

When a household is certified eligible for food stamp benefits, the local welfare office gives the head of household an identification card. This

paper card, containing the recipient's name, case number, and signature, is valid through the period of certified eligibility (typically six months). The recipient uses the ID card in obtaining food stamp coupons and in buying groceries.

GETTING BENEFITS TO RECIPIENTS

The computer-generated ATP that the household receives each month contains the recipient's name, address, and case number, and an expiration date. It specifies the amount of food stamp benefits authorized for the month. ATPs for the regular monthly benefits are currently issued to food stamp recipients in Berks County on two days. ATPs are mailed to half the recipients on the fourth working day of the month, and to the other half on the ninth working day.

The Food and Nutrition Service contracts with outside vendors to print and distribute coupons. Two companies currently have printing contracts. Coupons are printed in denominations of \$1, \$5, and \$10, and packaged in "books" with values of \$2, \$7, \$10, \$40, \$50, and \$65. The coupons have serial numbers, but carry no personal identification or expiration date.

The Pennsylvania welfare department contracts with a number of local banks to serve as issuance agents. At specified times, recipients may exchange their ATPs for food stamp coupons. The recipient must present the ID card to the bank teller and sign the ATP. The teller checks the signature against that on the ID card, and then records the name, case number, and amount and serial numbers of coupons issued. The teller keeps the ATP and gives the recipient the coupon books, which the recipient signs.

The banks generally maintain a two- to six-month inventory of coupons, in secure storage with limited access. Banks report monthly on the value of coupons received, issued, and in inventory.

ALLOWING RECIPIENTS TO BUY FOOD WITH BENEFITS

Recipients may use food stamp coupons at any food retail establishment authorized to participate in the Food Stamp Program.¹ They may use

¹Current rules allow virtually any establishment to participate if staple food items make up over 50 percent of eligible food sales.

coupons only to purchase authorized items; this excludes a number of non-food products and some prepared food items that many grocery stores sell.

The cashier may (but is not required to) ask recipients to present their food stamp ID cards before accepting coupons in payment. When the cashier announces the amount of the purchase, the recipient tears the appropriate amount of coupons out of the books or hands over entire books. Cashiers may not accept coupons previously torn out of the books, except for \$1 coupons.

The cashier may give up to 99 cents change in cash. If more change is required, it must be given in \$1 coupons.

CREDITING RETAILERS FOR BENEFITS ACCEPTED

To redeem coupons, store personnel must first endorse them with a stamp identifying the store. They must then count the coupons and complete a Redemption Certificate. The grocer takes the coupons and the Redemption Certificate to the store's usual bank. The bank generally receives the coupon deposit as if it were cash, crediting the grocer's account immediately. First, however, the teller counts the coupons and writes in the verified amount and his or her initials on the Redemption Certificate.

CREDITING BANKS FOR BENEFITS ACCEPTED

The bank then cancels the coupons and marks them with a bank name or number. It then bundles coupons from all of its grocer customers, fills out a Food Coupon Deposit Document, and ships the coupons, Redemption Certificates, and Deposit Documents to the Federal Reserve branch bank, which credits the bank.

The Federal Reserve branch bank receives the coupons, verifies that the amount is consistent with the bank's Deposit Document, and checks for counterfeits. The coupons are then destroyed, and the Deposit Documents and Redemption Certificates are sent to the Food Stamp Program's national data processing center in Minneapolis. The Federal Reserve Bank credits the local banks and debits the Department of Agriculture's account at the U.S. Treasury.

RECONCILING THE FLOW OF FUNDS

Three main reporting systems exist to identify losses of food stamp benefits. First, the state agency matches the issuance offices' records of redeemed ATPs against its own records of ATPs issued. This identifies multiple ATPs cashed for the same household and invalid ATPs that were cashed. Second, issuance offices file coupon inventory reports that reconcile coupons received, authorized and actual issuances, and coupons in inventory.

Third, the FNS data processing center in Minneapolis reconciles Redemption Certificates, Deposit Documents, and debit vouchers from the Treasury Department. The center also does statistical analysis of retailer data in the redemption reports. The purpose of the analysis is to identify stores that redeem more coupons than would be expected for their size and location. Stores identified as high redeemers are monitored for several months. If redemptions remain excessive, a field representative may make a compliance visit to determine the cause.

MANAGING RETAILER PARTICIPATION

In Berks County, retailers are authorized by the Philadelphia Field Office of the FNS Mid-Atlantic Regional Office (MARO). Interested establishments apply to this office for authorization. An office representative provides initial instructions to retailers and visits them periodically to monitor compliance with FNS regulations. This office also investigates allegations of non-compliance; retailers found to violate regulations may lose their authorization.

2.3 THE DEMONSTRATION SYSTEM IN READING

As with the ATP system, the state agency (PDPW) and the local agency (BCAO) authorize benefit issuance in the EBT system. EBT benefits, however, are maintained by the EBT Center, which is operated by the system contractor, Planning Research Corporation (PRC).¹ Recipients exchange EBT benefits for

¹For simplicity of presentation, we describe the demonstration system in the present tense. Some features of the EBT system changed after the end of the demonstration, but only those existing during the demonstration are described here.

issuance amounts to the accounts. For existing cases, the issuance amounts are added to the recipients' existing balances.

Card Issuance. Under the EBT system, the recipient's encoded Benefit Identification Card (BIC) replaces the ATP as the document authorizing the delivery of food stamp benefits. Instead of receiving a new ATP card in the mail each month, demonstration participants receive only one BIC (unless a lost, stolen, or damaged BIC needs to be replaced).

The head of household goes to the welfare office to obtain the BIC, although under certain circumstances, an authorized representative may make this visit. An issuance clerk takes the recipient's picture and produces a photo identification card. The recipient signs the card, which is then laminated to prevent tampering. The clerk encodes the card's magnetic stripe, completing the creation of the BIC.

To encode the BIC, the issuance clerk first queries the EBT data base with the household's case number, using an IBM-PC microcomputer linked by telephone line to the EBT Center. The system responds with information about the recipient and a system-generated BIC number. The clerk places the recipient's card in an attached encoding device and enters the BIC number on the microcomputer. The recipient selects a four-digit Personal Identification Number (PIN), which is entered on a PIN-pad attached to the microcomputer.

The system encodes three pieces of identifying information on the BIC: the BIC number, a PIN offset number and a check-sum digit. The PIN offset number is computed by the microcomputer and is based on the BIC number and the PIN. The check-sum digit, also computed by the microcomputer, is based on the BIC number and the PIN offset and serves as an additional security feature. For security reasons, the PIN itself is not encoded on the BIC.

The clerk then passes the BIC through a card reader attached to the microcomputer. The microcomputer transmits this information to the EBT Center to verify that the BIC number encoded on the card matches that generated by the system and to enter the PIN offset on the recipient's Master File record. Once the number has been verified, the clerk transmits the recipient's preferred language (English or Spanish) to the EBT data base.

After the encoding is completed, an income maintenance worker trains the recipient in how to use the BIC to purchase groceries, how to obtain

information about his or her current account balance, and what to do and whom to call in the event of problems. The recipient practices using the BIC with EBT equipment like that located in the grocery stores.

To allow other members of the food stamp household or authorized representatives to purchase groceries, the recipient is given an Alternate Shopper Card. This paper card includes the recipient's name and case number, but it does not have a photo or a magnetic stripe. Using the Alternate Shopper Card together with the recipient's BIC and PIN, a person designated by the recipient may buy groceries with the recipient's food stamp benefits.

When a BIC is lost, stolen, or damaged, the recipient notifies the local welfare office. The welfare office passes on the information to the EBT Center, which places the recipient's EBT account on "hold" if appropriate. This prevents any further transaction activity for the account. A new card is then assigned to the recipient using the process described above. If the recipient's PIN has been compromised, the recipient chooses a new PIN. The household's EBT account is updated with the new BIC number and PIN offset, and the hold status is removed.

GETTING BENEFITS TO RECIPIENTS

Benefits are considered to be delivered when they are electronically recorded in recipients' EBT accounts. Thus the EBT system eliminates much of this part of the issuance process by including it in benefit authorization.

Verifying the Recipient's Identity. Recipients' identities are verified in the ATP/coupon system when they exchange their ATP cards for coupons at issuance offices. Cashiers also may ask to see recipients' identification cards when coupons are presented to purchase food.

Under the EBT system, cashiers are expected to check the photo on the BIC before attempting the EBT purchase. If someone other than the recipient uses the BIC to purchase groceries, that person must present the recipient's Alternate Shopper Card.

The EBT system also verifies the identity of the recipient through the four-digit PIN. A Benefit Transaction Terminal (BTT), located at the checkout counter, performs the check. The cashier passes the recipient's BIC through the BTT's card reader and instructs the recipient to enter his or her

PIN on a PIN-pad attached to the BTT. The BTT internally computes a PIN offset number based on the card's BIC number and the entered PIN. It then compares the computed number with the PIN offset number encoded on the card. If the offsets do not match, the recipient must re-enter the PIN. If the recipient fails to enter the correct PIN in three tries, the BTT will accept no further attempts to use the BIC until another recipient's BIC has been used at that BTT. After the third incorrect entry, the BTT automatically transmits information about the unsuccessful PIN entry to the EBT Center.

Allowing three attempts to enter the correct PIN at the BTT represents a compromise between maintaining system security and recognizing that recipients might temporarily forget their PINs. Multiple attempts to enter an incorrect PIN could represent an unauthorized person attempting to discover a recipient's PIN through trial and error. Recipients who cannot remember their PINs must return to the welfare office and have their BICs re-encoded with a new PIN offset.

ALLOWING RECIPIENTS TO BUY FOOD WITH BENEFITS

Two methods are available for buying food with EBT benefits. When the central computer system and the retailer's EBT equipment are working, payment for food is handled electronically. If either the system or the store equipment fails, manual back-up procedures are used.

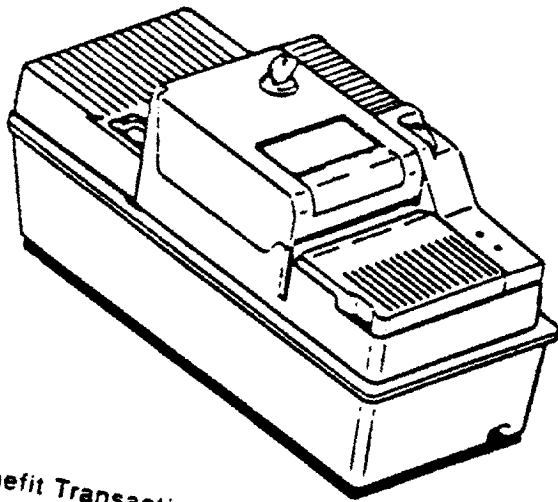
Electronic Purchases. Nearly all checkout counters in participating stores are equipped with BTTs, PIN-pads, and printers. Recipients may make food stamp purchases at any counter that is so equipped. As illustrated in Exhibit 2-1, each BTT has a handset which may be used to call the EBT Center for assistance, and a card reader.

After the cashier rings up the sale, the BTT verifies the recipient's identity as described above. The cashier then enters the total food stamp purchase amount on the BTT and presses a "Send" key. The BTT automatically dials the EBT Center computer and transmits information to identify the recipient and the store, the amount of the purchase, and a code to make sure that information is transmitted correctly.

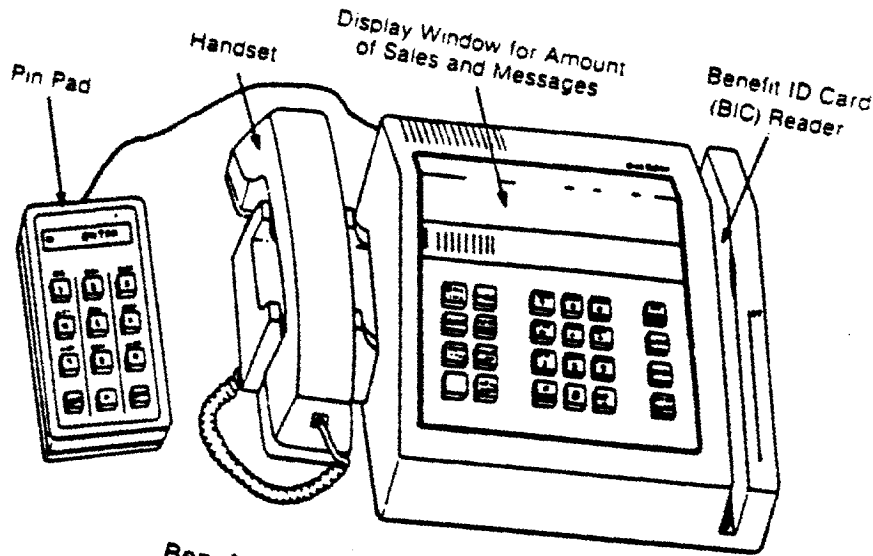
The computer at the EBT Center verifies that a valid EBT account exists. It then compares the recipient's balance to the purchase total. If

Exhibit 2-1

Benefit Transaction Terminal and Printer



Benefit Transaction Terminal (BTT) Printer



Benefit Transaction Terminal (BTT)

the balance is larger, the recipient's account is debited and the retailer's account is credited by the purchase amount.

The EBT Center then sends to the BTT a message indicating that the transaction is complete. The BTT prints a two-part receipt stating the amount of purchase, the recipient's remaining account balance, the date and time, and some identifying codes. The cashier gives the recipient one copy of the receipt. The other copy is retained on a journal tape within the printer and serves as the retailer's record of the EBT transaction.

If the recipient's balance is less than the purchase total, the BTT displays the difference. The recipient may pay this amount in cash or remove some items from the purchase. In either case, the cashier re-enters the transaction with the new purchase total.

Credits can also be transmitted through the BTT. If a cashier accidentally overcharges a recipient or if a recipient returns items for a refund, the cashier carries out a procedure very similar to that for a purchase. This results in a credit to the recipient's account and a debit to the store account. Such transactions require a "management override"; they can be processed only by individuals authorized by the store management. Each store has one store card, similar to the recipients' BIC, which must be used in credit transactions.

Manual Backup Purchase Procedures. If an electronic transaction cannot be processed at the EBT Center because its computers are down, a recipient may still purchase up to \$35 worth of groceries each day.

To accomplish a purchase in this situation, the cashier first passes the BIC through the card reader and has the recipient enter his or her PIN. After the BTT verifies the PIN, the cashier telephones an operator at the EBT Center to request authorization for a manual EBT transaction. The cashier tells the operator the client's case number (printed on the BIC) and the amount of purchase. The operator checks the recipient's balance on the previous day's report. If the recipient's balance is sufficient, the operator gives the cashier an authorization code and places a temporary debit against the recipient's account. The cashier records this authorization code, the case number, the purchase amount, and the store's identification number on a three-part manual sales form. The cashier retains one copy for the store,

gives one copy to the recipient, and sends the third copy to the EBT Center. The EBT Center checks the amount on the manual sales form against the temporary debit, and credits the retailer's account.

If an electronic transaction cannot be processed because the retailer's BTT is not working, no PIN check is performed. The clerk calls the EBT Center to request authorization for a manual EBT transaction. Again, the maximum daily authorization is \$35. The operator checks the recipient's current balance before authorizing the sale and places a temporary debit against the recipient's account. The remainder of the process described above is then carried out.

Mobile vendors, such as home delivery dairies, do not have access to BTTs. To process sales to food stamp customers, these vendors follow the same procedures that other retailers use when their EBT equipment is not working. The only differences are that the mobile vendors phone in transactions after they return to their office and that they are not subject to the \$35 limit on manual sales.

Providing Balance Information. In the ATP/coupon system, recipients count their remaining coupons to determine their benefit "balance". Keeping track of the electronic balance in the EBT system is much different.

The EBT Master File at the EBT Center contains information on each recipient's current balance. The EBT Center credits or debits recipients' accounts for issuances, purchases, and refunds as they occur. In the event of system failure, the EBT Center uses the latest daily recipient balance report to maintain each recipient's current balance. Operators log manual transactions on a log sheet and maintain ongoing client balances.

Recipients may determine their current EBT account balance by any of three methods. First, every time the recipient makes a purchase, the BTT receipt shows the remaining balance. Therefore, the most recent receipt usually shows the recipient's current balance. If the recipient's account has been credited with an issuance or debited with a manual sale since the last

EBT transaction, however, the balance shown on the last receipt will be incorrect.

Second, recipients may check their current account balance by using a BTT. In addition to the regular terminals located at checkout counters, recipients may use balance-only terminals located in 23 of the larger stores or a terminal located at the welfare office. To obtain a balance, the recipient or cashier passes the recipient's BIC through the card reader and the recipient enters the PIN. After PIN verification, the operator presses a "Balance" key on the BTT to send a balance request to the EBT Center. The Center sends the recipient's account balance to the BTT, which displays it.

Third, recipients can learn their account balance by using a touch-tone telephone to dial a special EBT Center number. This connects to the EBT computer. A synthesized voice answers, "Hello, please enter your case number" in both English and Spanish. After the recipient enters the case number, the voice unit responds (again, in both English and Spanish), "Please enter your Personal Identification Number." The recipient enters the PIN, and the voice unit responds (in either English or Spanish, depending upon the recipient's preferred language), "Your current benefits are..."

CREDITING RETAILERS FOR BENEFITS ACCEPTED

The EBT system credits retailers through an electronic transfer of funds to the retailers' bank accounts. Every afternoon, except weekends and legal holidays, the EBT Center totals each retailer's transactions for the prior banking day, which runs from 2:00 PM to 2:00 PM. The Center translates the retailers' account numbers and total transaction amounts into the standard National Automated Clearing House Association (NACHA) format used by financial institutions for electronic funds transfers. An EBT Center operator then physically delivers a tape containing this information and data on each retailer's bank to American Bank and Trust (AB&T) staff. AB&T requires that the delivery occur by 8:30 PM so that the bank can meet its Federal Reserve processing deadline of 12 midnight. (During the first seven months of operations, AB&T required the EBT delivery by 4:30 PM.)

Each night, AB&T transmits this deposit information to the Third District Federal Reserve Bank in Philadelphia. The Federal Reserve Bank debits AB&T's account by the sum of all retailer credits and distributes the

retailer credits to the retailers' bank accounts. Thus, the system is designed to credit retailers' accounts within one banking day after an EBT transaction.

CREDITING BANKS FOR BENEFITS ACCEPTED

Bank redemption of benefits in the EBT system involves only AB&T rather than all of the retailers' banks. Reimbursement of AB&T's Federal Reserve account occurs when AB&T initiates a wire funds request through the Treasury Financial Communications System network. This request, which goes to the Federal Reserve Bank in New York (FRBNY), is made the morning after AB&T's account is debited by the Federal Reserve Bank in Philadelphia. FRBNY draws down USDA's letter of credit with the United States Treasury, a special account established for the EBT demonstration. FRBNY simultaneously credits AB&T for the sum of the previous day's retailer credits.

Finally, the Treasury provides USDA with a daily report of the amount of the drawdown on USDA's letter of credit. USDA is also able to check its account activity by computer at any time.

RECONCILING THE FLOW OF FUNDS

Account balances and benefit transfers are reconciled at numerous points in the EBT system. As described below, the major reconciliations occur when benefits are issued by PDPW, when accounts and daily EBT purchase transactions are balanced, and when retailer accounts are credited through the Automated Clearing House (ACH) funds transfer network. In addition, retailers may balance their sales receipts against deposits to their bank accounts, and retailer deposits are checked against drawdowns of USDA's letter of credit with Treasury.

Reconciliation of Issuances. The EBT Center and PDPW take two steps to reconcile benefit issuances to the EBT Center. First, daily transmissions from PDPW to the EBT Center are checked when received. The last record of each transmission contains totals for the number of cases and the dollar amount of benefits to be updated. The EBT Center rejects the transmitted file and notifies PDPW if the issuance records do not sum to the case total and the dollar total. PDPW and the EBT Center immediately investigate and resolve the discrepancy.

For the second step, the EBT Center creates a file of all issuances placed in recipient accounts. This file has the same format as the tape files that PDPW produces when local issuance offices submit information on ATPs that have been redeemed. The PDPW calls the EBT Center about twice each month to request that these files be combined, copied to tape, and delivered to Harrisburg. PDPW then combines the EBT tape with its own tapes to conduct a state-wide reconciliation of all issuances.

Account and Transaction Reconciliation. The EBT Center reconciles all account balances and transaction activity each day after 2:00 PM. The Center produces a three-part System Daily Reconciliation Report using information in the EBT Master File and History File. The report covers recipient activity, retailer activity, and PDPW and AB&T activity.

The section covering recipient activity checks each account and the total for all accounts. It computes the recipient's current balance by combining the beginning-of-month balance with all debit and credit transactions for the month. Retailer accounts are reconciled by an analogous procedure. The reconciliation compares this balance to the balance recorded in the EBT Master File.

The reconciliation for recipients and retailers produces totals for the current day as well as for the month to date. Each day's total net debits (purchases minus refunds) for all recipient accounts are balanced against each day's total net deposits (sales minus refunds) for all retailer accounts.

The third section of the reconciliation report compares total funds received from PDPW to the sum of total funds remaining in recipients' accounts and total funds that have exited the system. Funds exit the EBT system either through transmission of deposits to AB&T or through conversion of benefits to ATPs.

EBT Center staff investigate and resolve any discrepancies discovered in the System Daily Reconciliation Report.

Deposit Reconciliation. When the EBT Center delivers the retailer bundle-up tape to AB&T, the bank checks the tape format and prepares a listing of all retailer accounts and deposit amounts on the tape. AB&T returns the tape and listing to the EBT Center after the deposit information is entered into the ACH network. The EBT Center verifies the accuracy of the deposit

information by comparing the listing with its own records of store deposits for the day.

Other Reconciliation Activities. Once they enter the ACH network, deposits from the EBT demonstration are subject to the same reconciliation procedures as any other fund transfers. Retailers reconcile BTT transaction receipts with deposit information provided by their banks. The Food and Nutrition Service reconciles retailer redemptions against drawdowns of its letter of credit at its Regional Data Center in Minneapolis. FNS also reconciles monthly issuances in the EBT system by comparing EBT Center reports to information provided by PDPW.

Management Reports. In addition to reconciliation reports, the EBT system produces a number of management reports. These include statistical summaries of monthly activities, system trouble reports, and logs of problems reported by retailers.

MANAGING RETAILER PARTICIPATION

Management of retailer participation under the EBT system is similar to this function under the ATP/coupon system. The FNS Field Office in Philadelphia authorizes new retailers and monitors compliance. Upon authorizing a new retailer, however, the Field Office notifies the EBT Center that equipment installation can take place. Upon learning of a store closure or disqualification, the Field Office notifies the EBT Center to remove the EBT equipment. Retailer management functions in an EBT system would normally include investigatory visits to stores suspected of non-compliance with program regulations. Because of the complex issues involved in establishing EBT accounts for investigators, and because the demonstration system was expected to operate for only about a year, no such visits were scheduled during the original demonstration. Investigatory visits were conducted during the extended demonstration, however.

Chapter Three

EFFECTS OF THE EBT SYSTEM ON THE COSTS OF ADMINISTERING THE FOOD STAMP PROGRAM

In sponsoring the EBT demonstration, the Food and Nutrition Service sought to determine the cost of administering an EBT system. FNS was particularly interested in how the administrative cost of an EBT system would compare with that of a coupon-based issuance system.

The cost of administering the Food Stamp Program is a major policy concern of FNS. Although benefit issuance costs make up a relatively small portion of total administrative cost, they are nonetheless substantial. A study of existing food stamp issuance systems estimated that FNS and state agencies spent at least \$237 million on state-level issuance costs during the twelve months beginning in April 1982.¹ The full cost of food stamp issuance, including direct FNS costs, was even higher.

The EBT system was seen as a way to eliminate the costs associated with food stamp coupons and other documents used in the issuance process. The ATP/coupon system requires expenditures for coupon printing and distribution, ATP printing and mailing, exchanging ATPs for coupons, and processing retailers' coupon deposits. Added costs arise from the need to replace lost or stolen documents and from reporting and investigatory activities.

The EBT system would eliminate many of these costs, but it would require new resources. Major EBT system costs include central computer equipment and staff, store equipment, maintenance, and communications lines. In addition, the EBT system uses some of the same resources as the ATP system, such as State agency staff and FNS personnel.

¹Carol Olander, Norman A. Linn, Lura Myers, Richard J. Steele, Evaluation of Existing Issuance Systems in the Food Stamp Program, Volume I. Alexandria, VA: USDA/Food and Nutrition Service, and Birch and Davis Associates, Inc., (1984). Note that issuance costs are only those concerned with putting benefits in recipients' possession and redeeming the benefits. Most of the cost of administering the Food Stamp Program is incurred for other purposes, principally determining households' eligibility and the amount of benefits to which they are entitled.

The Reading EBT demonstration provides a test of whether the savings produced by an EBT system could be greater than the added costs. The test has important limitations, however. Although the Reading EBT system eliminated some key issuance costs in the Food Stamp Program, several factors were likely to make its cost higher than that of the coupon system or any established system. These included:

- Scale - The EBT system was very small (only 3,400 participating households) relative to the coupon system, which includes nearly 400,000 households in Pennsylvania. Fixed or nearly fixed costs (such as the staff of the EBT Center) were spread over a small number of cases, leading to a higher cost per case.
- Development costs - The cost of the EBT demonstration included the design, development, and implementation of the system, as well as operating costs. Even after the system began operations, PRC's technical team and FNS staff spent several person-years on improving operations.
- Special efforts required by a demonstration - The EBT system had to provide more information than is required of the coupon system. PRC and PDPW made special efforts to meet evaluation requirements and to provide information to interested parties outside FNS. PRC and PDPW also had to secure and maintain the cooperation of system participants.
- Other special demonstration costs - The specialized staff required by the demonstration were more costly than the operational staff state agencies would employ for comparable tasks. The short time span of the project meant that equipment was leased; an agency implementing a permanent system would purchase it at a lower long-run cost.

These factors made it important to examine the expected administrative cost of a large-scale, permanent EBT system as well as the actual demonstration cost. A permanent system would presumably cost less per case month than the demonstration because of economies of scale and lower costs possible in such a situation. Policy makers need information on how much savings (relative to the demonstration cost) might be expected in the long run, and under what conditions an EBT system might cost less than the ATP/coupon system.

operated on the same scale is projected to have operating costs of about \$14 per case month. EBT operating costs could be reduced further by increasing the caseload served, sharing mainframe facilities with other welfare programs, or sharing store terminals with a commercial debit card system. EBT costs are likely to fall as point-of-sale equipment technology becomes more advanced and less expensive. Under current conditions, however, very favorable circumstances would be needed to bring EBT costs in line with the \$3 coupon cost.

3.1 COST OF DESIGNING, DEVELOPING, AND IMPLEMENTING THE EBT SYSTEM

The Reading EBT demonstration went through four distinct phases of effort before the system entered the phase of routine operations:

- the development of the demonstration RFP (April 1982 - June 1983)
- the design phase (July - December 1983, Phase I of the demonstration contract)
- the development phase (January - July 1984, Phase II)
- the start-up or implementation phase (August 1984 - June 1985).

In total, the development process cost about \$2.3 million and required almost 31 person-years of effort. The personnel effort and the costs for each of these phases are summarized in Exhibit 3-1 and discussed in more detail below.¹ The data for this discussion come from interviews with key personnel at FNS, PDPW, MARO, BCAA, and PRC, and from PRC cost reports. Breakdowns of PRC costs by task are presented in Appendix III-B (pp. III-9-13).

DEVELOPMENT OF THE DEMONSTRATION RFP (April 1982 - June 1983)

In April 1982, after having explored alternatives to existing food stamp issuance systems for some time, FNS national level staff began to draft the Request-for-Proposals (RFP) for a demonstration of an electronic food

¹The descriptive material in this section is drawn largely from the more detailed discussion of the development of the EBT system in John A. Kirlin, Developing an Electronic Benefit Transfer System for the Food Stamp Program, Cambridge, Massachusetts: Abt Associates Inc., August 1985.

Exhibit 3-1

Design, Development and Implementation Costs of the EBT Demonstration

	PRC		FNS-National		MARO and PFO		PDPW		BCAO		TOTAL	
	PERSON-YEARS OF EFFORT	COST	PERSON-YEARS OF EFFORT	COST	PERSON-YEARS OF EFFORT	COST	PERSON-YEARS OF EFFORT	COST	PERSON-YEARS OF EFFORT	COST	PERSON-YEARS OF EFFORT	COST
<u>Pre-Design Phase</u>												
Labor			1.25	\$50,600							1.25	\$50,600
Fringe ^a				5,971 ^a								5,971
Other				20,000								20,000
Total			1.25	76,571							1.25	76,571
<u>Design Phase</u>												
Labor	3.2	\$225,978	0.8	33,059	0.04	\$1,046	0.12	\$2,542	0.01	\$306	4.17	262,931
Fringe ^a		(a)		3,901		163		1,068		129		5,261
Other		30,731										30,731
Total	3.2	256,709	0.8	36,960	0.04	1,209	0.12	3,610	0.01	435	4.17	298,923
<u>Development Phase</u>												
Labor	13.11	849,278	0.9	36,432	0.38	15,382	0.52	11,010	0.95	14,275	15.86	926,377
Fringe ^a		(a)		4,299		2,400		4,624		5,996		17,319
Other		226,735										226,735
Total	13.11	1,076,013	0.9	40,731	0.38	17,782	0.52	15,634	0.95	20,271	15.86	1,170,431
<u>Implementation Phase</u>												
Labor	5.9	533,343	0.96	38,861	0.7	21,183	0.6	26,256	1.35	21,751	9.51	641,394 ^b
Fringe ^a		(a)		4,586		3,305		11,028		9,135		28,054
Other		57,545				2,247		20,396				80,188 ^c
Total	5.9	590,888	0.96	43,447	0.7	26,735	0.6	57,680	1.35	30,886	9.51	749,636
<u>Total for all Phases</u>												
Labor	22.21	1,608,599	3.91	158,952	1.12	37,611	1.24	39,808	2.31	36,332	30.79	1,881,302
Fringe ^a		(a)		18,756		5,867		16,720		15,260		56,603
Other		315,011		20,000		2,247		20,396				357,654 ^c
Total	22.21	1,923,610	3.91	197,708	1.12	45,725	1.24	76,924	2.31	51,592	30.79	2,295,559

^aPRC fringe and overhead included in labor; PDPW fringe: 42% (applies to BCAO as well); MARO fringe: 15.6%; FNS national office fringe: 26.4%.

^bImplementation effort and cost for PRC exclude routine operations, estimated at 0.83 person years per month or \$28,632 per month.

^cPRC non-labor cost for implementation is partial estimate from known implementation costs.

stamp issuance system. At the same time, FNS staff developed an RFP for alternative paper-based systems, although no paper-based project was ultimately funded.

In developing the RFP for the EBT demonstration, FNS project staff consulted extensively with representatives of the retail food industry to ensure that the demonstration design would be acceptable to grocers. FNS also received input from an advisory panel drawn from several units of the Department of Agriculture, including the Office of the Assistant Secretary for Governmental and Public Affairs, the Office of the Inspector General, the Office of General Counsel, and the Office of Information Resources Management. FNS staff developed the specifications for the functional requirements to be met by the proposed design. The Mitre Corporation reviewed the draft RFP under a contract to FNS.

FNS issued the RFP in draft form in September 1982 to obtain feedback from potential contractors. FNS then reviewed the comments, revised the RFP, and issued the final RFP in January 1983. FNS awarded the contract to design, develop, and implement an EBT system to Planning Research Corporation (PRC) in July 1983.

Estimated RFP Cost. FNS staff spent approximately 1.2 person years developing the demonstration RFP, at an estimated cost of \$76,571 (including salaries and fringe benefits), as shown in Exhibit 3-1. This cost resulted from the extensive consultation process and the effort to issue both a draft and a final RFP. In addition, FNS spent \$20,000 on the cost of the contract to review the RFP and another contract to review the proposals. No other parties in the EBT demonstration incurred costs during the RFP development phase.

DESIGN OF THE EBT SYSTEM (July - December 1983)

PRC had developed a preliminary design as part of its proposal to FNS, and began elaborating on it immediately after contract award and submitted the draft design in September 1983. During the design period, senior PRC systems engineers and programmer analysts developed draft versions of operating manuals, the system test plan, the implementation plan, and the system design. PRC and FNS met biweekly to discuss design and contract issues.

PRC continued to seek the support of the potential participants in the system during the design period, as it had while preparing its proposal. This effort included briefings for Reading area retailers, banks, and community organizations to obtain input and to facilitate cooperation. PRC developed and distributed a publicity package soliciting retailers' participation in the demonstration, using a mailing list and labels provided by MARO from the FNS retailer data base. PRC, MARO, and BCAO conducted an analysis of Reading area retailers to determine the shopping patterns of demonstration participants, to provide the basis for the final boundaries of the demonstration.

A Critical Design Review was held on October 20, 1983, with attendees including representatives of FNS's national office, the technical assistance contractors to FNS, the USDA Office of the Inspector General, MARO, PDPW, PRC, and American Bank and Trust. Several design issues were raised in this meeting, requiring further effort before FNS could give PRC final approval. Under preliminary approval from FNS, PRC started training programmers and developing the software design framework. PRC also ordered key equipment, including the Series/1 computer for the development phase.

Estimated Design Cost. The total effort expended in Phase I was 4.2 person years, at a cost of \$298,923. As Exhibit 3-1 shows, PRC expended most of the effort (3.2 person years) and incurred most of the cost (\$256,709). FNS national level staff spent 0.8 person years on the design phase, at a cost of \$36,960. The activities of MARO, PDPW, and BCAO, which mostly involved retailer enrollment, made up the remaining 0.2 person years of effort. PRC spent \$30,731 on non-labor costs, including travel, consultant services and general and administrative expenses. (See Appendix III-B (pp. III-9) for a breakdown of PRC costs.)

DEVELOPMENT OF THE EBT SYSTEM (January - July 1984)

FNS gave PRC formal approval to begin development of the EBT system (Phase II) in January 1984. The major tasks PRC accomplished during Phase II included: ordering and modifying the hardware for the system, writing and testing system software modules, resolving outstanding design issues, preparing for system implement, and testing the system prototype. FNS national level staff were extensively involved in resolving the design issues, review-

ing PRC's documentation, and attending and evaluating the functional demonstration test in Reading in July 1984.

PRC, MARO, and PDPW prepared for system implementation in several ways. PRC began recruiting stores in the larger demonstration area, and held a meeting in February to update retailers. MARO supplied the labels for PRC's second wave of mailings and sent a letter to all area retailers on the status of the project. PRC surveyed the enrolled stores in March and April to determine their needs for terminals and telephone lines. PRC worked with PDPW staff to develop recipient and retailer training materials and to plan for system implementation. In April, BCAO began to issue photo ID cards to recipients who would be in the demonstration, so that they would be ready for card encoding and training when the implementation phase began.

Estimated Development Cost. The development phase of the EBT demonstration required nearly 16 person years of effort by PRC and the government agencies involved (as shown in Exhibit 3-1), at a cost of \$1,170,431. PRC incurred nearly all of this cost, spending 13.1 person years, mostly for senior and mid-level programmer analysts to develop software. PRC's major non-labor costs during the development phase were consultant services, travel, data processing, equipment rental, and other direct charges, totaling \$226,735.

During Phase II, FNS national staff spent 0.9 person years on their planning, coordination, and oversight responsibilities, for a cost of \$40,731. BCAO's cost was \$20,271 for 0.95 person years of effort to issue cards, plan recipient training, and secure space for EBT operations. PDPW's Phase II cost was \$15,634 for 0.5 person years associated with attending meetings and tests and preparing for implementation. MARO staff spent 0.4 person years on retailer enrollment issues and liaison between FNS national staff and PDPW.

The cost of the system development phase was somewhat higher than expected for several reasons. First, the design review process raised several issues that required FNS and PRC effort to resolve, including: who would authorize manual sales; how to guarantee 24-hour system availability; whether BCAO would be able to encode recipients' cards at the time of certification; and procedures for mobile vendors. Second, the expansion of the demonstration from 80 to 110 stores also increased the effort required in the development

phase. Third, problems identified during the functional demonstration test in July (such as system acceptance of invalid PINs) also delayed implementation and added to the development cost.

IMPLEMENTATION OF THE EBT SYSTEM (August 1984 - June 1985)

PRC began to install the EBT system equipment in August, after receiving approval from FNS to begin system implementation. First, PRC established the EBT Center, had the computer equipment installed and tested, and equipped BCAA and several stores with their EBT equipment. PRC then conducted an acceptance test to demonstrate the system's performance to FNS and other parties. Although most of the system functions operated successfully, PRC had to modify software and retest some functions. PRC also conducted a limited stress test of the system in September.

The installation of store equipment during the implementation phase involved Pennsylvania Bell and PRC's technicians. Pennsylvania Bell installed telephone lines for those stores that required separate lines for EBT terminals, and the PRC technicians installed the BTTs and printers. The installation process took 2 to 4 hours per terminal, depending on the location desired by the retailer.

PRC trained all system participants, except recipients, in September. PDPW staff were trained to conduct the recipient training and to use the EBT equipment at BCAA. In mid-September, PRC trained 800 grocery store personnel in a series of one-hour group sessions. PRC trained MARO and Philadelphia Field Office (PFO) staff to serve as facilitators for grocers and recipients during the initial weeks of system operations.

The EBT system began operations on October 1, 1984 with the first benefit issuance to EBT accounts and the first recipient training session. PDPW trained recipients and encoded their cards in three waves, beginning in October and ending with the training for recipients with special needs (Spanish speakers, the disabled, and others) in January 1985. OIM provided the trainers; BCAA staff scheduled recipients in groups of 15 to 30 and encoded the cards. The FNS facilitators visited grocery stores during the first month of operations, observing and helping solve problems.

PRC continued to modify the system for nine months after start-up as technical staff responded to various capacity and processing problems. PRC revised a key software module to speed up batch processing, reprogrammed some store terminals to allow more time to process transactions, added a seventh telephone line for terminal access, and reconfigured the system to store files on a larger disk that could be shared between the two computer units.¹ All of this effort was complete by July 1985, when system operations were largely stabilized.

Estimated Implementation Cost. The cost of implementing the EBT system, including PRC's efforts after the start of operations, was \$749,636. Nearly 10 person years of effort were spent in total; PRC spent 5.9 person years.

The PRC implementation cost estimate of \$590,888 represents the labor and other resources used during the implementation phase for all purposes other than routine operations (including project management and technical support). The labor for implementation includes the 2.2 person-years spent on equipment installation and other preparations before start-up, plus the PRC staff effort in excess of that required for routine operations during the operational part of the demonstration. The level of effort for routine operations was determined from PRC's labor during the "steady-state" months of August through October 1985. This level of effort (9.9 full-time equivalents (FTE)) was subtracted from the total PRC effort during the October 1984 to June 1985 period to estimate the incremental effort for system modifications and trouble-shooting. The PRC non-labor cost estimate includes installation of telephone lines, EBT Center equipment installation, and travel associated with implementation and other nonroutine activity.

PDPW spent \$57,680 on training recipients and other implementation activities; in addition, BCAO spent \$30,886 on scheduling training, encoding cards, and dealing with early problems in system operations. FNS national staff put in nearly one person year of effort between August 1984 and February

¹For a discussion of these problems, see Kirlin, op. cit. The process of modifying the system design to resolve these problems involved proposals for modifications submitted by PRC, which FNS evaluated with the assistance of a contractor.

1985 at a cost of \$43,447. (FNS costs related to system modifications were indistinguishable from normal oversight effort after February 1985.) The MARO/PFO effort for implementation, including facilitator training and fielding the facilitators, cost \$26,735.

SUMMARY OF DESIGN, DEVELOPMENT, AND IMPLEMENTATION COSTS

The total effort spent on designing, developing, and implementing the EBT system was approximately 30.8 person years, at a cost of \$2.3 million. PRC's effort amounted to over 22 person years, at a cost of about \$1.6 million for labor and overhead and \$315,000 for other costs. The largest effort on the government side of the project was the 3.9 person years spent by national level FNS staff, with a total FNS cost of \$197,708. The total cost for MARO and Philadelphia Field Office activities was \$45,725, reflecting 1.1 person years of effort. The combined effort for PDPW and BCAO was 3.5 person years, with a cost of \$128,516.

3.2 OPERATING COSTS OF ATP/COUPON AND EBT SYSTEMS

The operating costs of the ATP/coupon and EBT systems result from executing five basic functions necessary to the Food Stamp Program:

- authorizing recipients' access to benefits
- delivering benefits to recipients so they can purchase food
- crediting retailers for recipients' food stamp purchases
- managing retailer participation in the Food Stamp Program
- reconciling authorized transfers of benefits with actual benefit transfers and monitoring issuance and redemption operations.

This section presents the estimated cost of performing these functions in the ATP/coupon system and the EBT system during the demonstration. The discussion explains how the functions are performed in each system. The EBT system is described as it operated during the original demonstration; some procedures have been changed since the demonstration ended and PDPW began operating the system.

As noted earlier, the operating costs of the demonstration EBT system probably do not represent the costs of a large-scale permanent EBT system, even though the estimates are drawn from the period of the demonstration that most closely resembled normal, steady-state operations. Thus, the comparisons of cost in this section must be interpreted with care.

Special estimation procedures were used to calculate indirect costs for BCAO and other PDPW units and for FNS. These procedures are discussed in Appendix III-C (pp. III-14-18). The allocation of PRC costs among the issuance functions was based on the distribution of EBT Center staff time, as measured in the October 1985 time study. This allocation is explained in Appendix III-D (pp. III-19-22).

AUTHORIZING ACCESS TO BENEFITS: ATP/COUPON SYSTEM

Identification Card. In the ATP/coupon system (as operated in Berks County), the BCAO issues a paper identification card to each recipient household. Once a household is certified eligible, the caseworker requests that a clerk prepare a card for the primary recipient. The clerk types the recipient's name and case number on the blank card, files the carbon copy of the card, records the issuance of the card, and mails the card to the recipient together with the notice of eligibility. The recipient signs the paper ID and uses it as proof of identity when exchanging the ATP card for coupons. Retailers may ask to see the ID as proof of eligibility when accepting food stamps for purchase.

If a food stamp identification card is lost, stolen, or damaged, the recipient contacts the assigned continuing eligibility caseworker at BCAO. The caseworker verifies the need for a new card over the telephone and completes a form requesting the issuance of a new card by the clerical unit. The clerk follows the same procedures for a replacement card as for a new card. Replacement cards also are issued when information on the card changes, such as the client's name or address.

ATP Card. PDPW prints and mails an ATP card to each household for the month in which the household is certified and each succeeding month. This card states the amount of the household's benefits, together with the primary recipient's name, address, case number, and other information. The ATP enables recipients to obtain their food stamp allotments.

The Office of Information Systems (OIS) of PDPW prints the ATP cards at its central computer facility in Harrisburg. OIS generates the regular monthly issuance files from the Food Stamp Master File on its Sperry 1182 computer system. (The recipient record in the Master File is created by a clerk as a result of the certification process, and updated as needed because of changes in circumstances or recertification.) The issuance file is then transferred to an IBM 370 computer, which prints and punches the ATP cards from the file. OIS runs the regular issuance program on the first ten working days of the month. At the beginning of the demonstration, all ATPs for Berks County were printed on a single issuance day; in July 1985, the caseload was divided between two issuance days, a week apart.

After being printed, the ATPs for Berks County and most other counties in Pennsylvania are bundled by the OIS Production Control staff and delivered to the PDPW mailroom. Clerks in the mailroom stuff the ATPs into envelopes using machines that can stuff 4,000 envelopes per hour. The mailroom sends the ATPs to a contractor to presort them by nine-digit ZIP code, permitting PDPW to pay the reduced postage rate for presorted mail.

Nonroutine ATPs. BCAO initiates the issuance of nonroutine ATPs, including initial allotments for newly authorized recipients, supplemental allotments following an increase in benefits, and replacements for lost or stolen ATPs. In all instances, a caseworker authorizes issuance of the ATP and a clerk enters the necessary data on a terminal connected to the OIS computer. In the case of new recipients or increases in benefits, the computer system automatically creates an issuance record as it creates or updates the Master File case record.

Lost and Stolen ATPs. A client whose ATP has been lost or stolen meets with the caseworker to verify the loss and to sign the necessary forms. On receiving a request for a replacement ATP, the caseworker instructs the clerical unit to verify that the ATP was issued and that it has not been exchanged for coupons. Once the clerical worker has checked the household file and the recipient has signed the form, the caseworker authorizes the clerical unit to issue a replacement ATP. The clerk enters the data for the replacement on the OIS host system and sends a notice to the client. OIS runs a program at the end of each work day to accumulate all special issuances and print the ATPs that evening.

PDPW handles blank ATP cards with special procedures to prevent their fraudulent use. The cards are preprinted with serial numbers by a contractor, who is required to account for any missing or out-of-sequence blanks. Blank cards are stored in a secure room in the PDPW warehouse and counted by machine before being dispatched to OIS for printing.

Estimated Authorization Costs. The cost of issuing ATPs and ID cards to recipients in Berks County, shown in Exhibit 3-2, is \$0.82 per case month. Most of the cost (\$0.73) is associated with authorizing, printing, and mailing ATPs. The cost covers the activities of caseworkers and clerical staff at BCAO, OIS labor and computer costs, postage, handling costs, envelopes, blank cards, and indirect cost. (See Appendix III-E (pp. III-23-35) for detailed breakdown of costs and estimation procedures.) The postage cost associated with authorizing access to benefits is over \$0.19 per case month. OIS computer costs to produce ATPs total \$0.22 per case month.

The estimated cost of BCAO staff time to deal with ID cards and ATPs is about \$0.24 per case month. Other PDPW labor for these functions amounts to about \$0.01 per case month. Most of the BCAO effort is for nonroutine ATP-related activities. The cost of this effort is small because problems with ATPs or ID cards involve only a small proportion of the caseload in a given month. (Unmatched ATPs amounted to only 0.52 percent of all benefits in Berks County in Fiscal Year 1984.) Furthermore, most of the effort in resolving problems with ATPs and IDs is spent by clerical staff, whose time is less expensive than that of the caseworkers.¹

AUTHORIZING ACCESS TO BENEFITS: EBT SYSTEM

EBT Card. BCAO issues a photographic identification card with a magnetic stripe to each household in the EBT demonstration. This card serves as the recipient's proof of eligibility and provides access to the household's benefits. Recipients use the cards to activate terminals in grocery stores where they use their benefits.

¹The BCAO cost for dealing with ATP problems includes time spent by caseworkers and clerks on unmatched ATPs, but not the effort of Bureau of Claims Settlement personnel at the local and state levels. This latter cost is considered a "fraud and abuse" cost, not an issuance cost.

Exhibit 3-2

**Cost of Authorizing Access to Benefits:
ATP System vs. EBT System**

<u>Item</u>	<u>ATP System Cost per case month</u>	<u>EBT System Cost per case month</u>
<u>ID Card Cost</u>		
ID card issuance labor	\$0.068	\$0.360
Other ID card costs	<u>0.026</u>	<u>0.408</u>
Total	\$0.094	\$0.768
<u>Other benefit access authorization costs</u>		
Labor	0.180	0.572
Other	<u>0.550</u>	<u>0.252</u>
Total	\$0.730	\$0.824
Total cost of authorizing benefit access	\$0.824	\$1.592

Sources: BCAO Time Study, PDPW interviews, PDPW data, PRC data, EBT Center Time Study.

Note: See Appendix III-E for detailed cost items.

When a new demonstration area household is certified as eligible for food stamps, a clerk sends a notice that the head of the household must come to the BCAO office for a photo ID card and training. BCAO staff take ID photos, encode the IDs as Benefit Identification Cards (BIC) for the EBT system, and train recipients to use the cards. Training occurs in group sessions held each Wednesday and Friday. (From one to four sessions take place on each training day, depending on the number of recipients needing cards.) Prior to the session, a clerk types inserts for the cards with the recipients' names and case numbers.

At the beginning of the session, a clerk photographs each recipient with a special camera that superimposes the photograph on the card insert and produces two copies. The recipients sign the inserts. The clerk encases each card in a plastic pouch containing the magnetic stripe.

Meanwhile, a Special Activities Unit caseworker explains the demonstration to the recipients, using a specially developed video tape. In the first part of the training session, the recipients select their Personal Identification Number (PIN) codes. A clerk takes the PIN designations and the cards to another clerk, who encodes each recipient's card with the case number and the PIN-offset (a code based on the PIN). The encoding clerk uses an IBM personal computer (PC) with specially developed software and a magnetic card encoder/reader. The PC is linked via a phone line to the main EBT computer, which computes the PIN-offset and records the new account information on the EBT data base. When the encoding is complete, the account is activated, enabling the recipient to use the benefits in the account.

The caseworker conducting the training session demonstrates the use of a benefit card on specially adapted benefit transaction terminals in the

picked up the tape at OIS in Harrisburg and took it to the EBT Center in Reading.) The EBT system operator checks the tape and runs the benefit update program to post the new benefits and new accounts to the data base. When the entire EBT caseload received issuances on a single day, this program took 4 to 5 hours to run. For the daily special issuances, which generally involve only a few cases, the PDPW operator transmits the file by telephone, using a modem and a data encryptor supplied by the demonstration. The EBT system operator checks the file, sends a confirmation message to PDPW, and runs the update program.

Estimated Benefit Authorization Cost. As Exhibit 3-2 shows, the cost of authorizing access to benefits in the demonstration EBT system, \$1.59 per case month, is considerably greater than the cost for the same function in the ATP/coupon system. Over half of the estimated cost (\$0.82) is the cost of posting benefits and resolving account problems, including the EBT Center labor to run the issuance programs and to support BCAO's functions, together with the computer time and support costs associated with that labor. In October 1985, the EBT Center staff spent 33 person-hours per month on these functions. (See Appendix III-D (pp. III-19-22) for time study data on EBT Center operations and allocation of PRC costs to issuance functions.)

The \$0.77 per case month cost of issuing photo IDs (including new and replacement cards) and training recipients exceeds the cost of paper ID issuance by a factor of 8 to 1. Higher labor cost is a significant factor in the photo ID cost. Both clerical staff and caseworkers spend more time per case on photo IDs than on paper IDs. The tasks associated with photo ID issuance are more complex, and they require the cooperation of the client. A substantial amount of the time spent on photo ID activities (as documented in the time study) involves rescheduling of appointments and sending notices to no-shows. The particular photo ID card used for the demonstration appears prone to damage: BCAO was replacing an average of 50 photo IDs per month in late 1985. (See Exhibit III-E11 (p. III-35) for data.) The cost of the equipment for encoding IDs contributed \$0.18 per case month to the EBT ID issuance cost during the demonstration.

DELIVERING BENEFITS TO RECIPIENTS: ATP/COUPON SYSTEM

In the ATP/coupon system, recipients obtain their benefits in the form of paper coupons that they can use at authorized grocery stores. The

delivery of benefits to recipients includes the provision of a supply of food stamp coupons to the coupon issuance points and the exchange of the ATP card for the recipient's allotment of coupons. This process involves FNS, PDPW, and the issuance agents.

Supplying Coupons. FNS bears the cost of printing the coupons, maintaining a central inventory, and shipping coupons to storage points maintained by state food stamp agencies. Because each coupon is used only once and then destroyed, the coupon printing and supply costs are substantial. In Fiscal Year 1985, FNS paid \$20,000,000 to a competitively selected firm for coupon printing, or \$0.23 per case month. This cost includes the contractor's accountability for all materials and equipment used in the process.¹ Another contractor maintains the secure facility for storing coupons until they are shipped to the state storage points. The cost of this contract, which includes preparation of shipments and extensive inventory controls, was \$700,000 in Fiscal Year 1985, or \$0.008 per case month.

The Coupon Production and Supply Unit (CPSU) of FNS coordinates shipment of coupons to storage points maintained by state agencies administering the Food Stamp Program, including PDPW. The PDPW Division of Food Stamp Administrative Services (DFSAS) monitors the food stamp inventory at the State's bulk storage points, projects coupon demand and prepares orders for submission to the MARO. DFSAS notifies the Coupon Issuance and Accountability Unit (CIAU) at MARO by telephone of the amount of the order and sends a confirmation form. CIAU checks the order and relays it to CPSU, which arranges the shipment and notifies CIAU of the date. Coupon orders are shipped by a variety of modes, including freight carriers and the Postal Service.

PDPW contracts with several firms to maintain secure bulk storage of coupons and to deliver orders to the issuance offices. The DFSAS at PDPW uses the issuance offices' monthly food stamp inventory reports (FNS-250) together with a computerized demand model to schedule deliveries of coupons. During the demonstration, DFSAS automated the processing of the FNS-250s, reducing substantially the effort required to monitor the inventory. (See the discus-

¹The coupon production contract cost has been substantially reduced since FY1985. The projected cost for September 1986 to July 1987 is \$14.5 million, or \$0.169 per case month. (Source: FNS Administrative Services Division, telephone interview, January 8, 1987.)

sion of reconciliation later in this section for the description and costs of the FNS-250 entry process.)

DFSAS also increased the maximum inventory held at issuance points to six months' supply and reduced the frequency of coupon deliveries to the issuance points from once a month to every four months. This change reduced the annual cost of the PDPW coupon delivery contracts from over \$500,000 to around \$250,000 and also reduced the staff time associated with coordinating deliveries to issuance points.

Estimated Coupon Supply Cost. The entire process of producing, shipping, and storing food stamp coupons costs approximately \$0.33 per case month, as shown in Exhibit 3-3. DFSAS staff account for nearly all of the \$0.013 per case month in labor costs. All of the non-labor costs are for contractors, including \$0.23 per case month for coupon printing. Storage and delivery costs make up the rest of non-labor costs. (See Appendix III-E (p.III-26) for more details on coupon supply costs.)

Exchanging ATPs for Coupons. ATP/coupon system recipients in Berks County obtain their monthly food stamp allotments by presenting their ATP cards and their food stamp ID cards at issuance offices (banks under contract to PDPW). The teller checks the case number on the ATP against the ID card and confirms that the ATP has not expired, stamps the ATP with audit information, and instructs the recipient to sign the ATP. The teller then checks the signature against the ID card and counts the coupon books to be issued. While the recipient signs each coupon booklet, the teller records the number of books of each type issued. If the recipient has no ID card, the teller may verify the recipient's identity by telephoning a caseworker at BCAO.

Issuance office staff are responsible for managing the coupon inventory, including receiving and logging shipments, tallying ATPs redeemed, and counting books in inventory. They also complete the FNS-250, documenting the coupon inventory and discrepancies between the value of ATPs received and coupons issued.

DFSAS at PDPW oversees the issuance offices and generates the invoices for payment of the \$1.10 fee for each ATP transacted. DFSAS staff record the addition of new offices, the termination of issuance offices, and changes of address or ownership. Although the number of issuance offices in

Exhibit 3-3

**Cost of Delivering Benefits:
ATP System vs. EBT System**

ITEM	ATP SYSTEM COST PER CASE MONTH	EBT SYSTEM COST PER CASE MONTH
Coupon management labor	\$0.013	-
Other coupon production, shipping and management costs	<u>0.319</u>	-
Subtotal	\$0.332	-
Issuance office management and payment labor	0.006	-
Issuance office fees and other ATP transaction costs	<u>1.263</u>	-
Subtotal	\$1.269	-
EBT system transaction support labor	-	\$7.263
Other system transaction support costs	<u>-</u>	<u>14.362</u>
Total Benefit Delivery Cost	\$1.601	\$21.625

Sources: PDPW and FNS interviews, PDPW data, PRC data, EBT Center Time Study.

Note: See Appendix III-E for detailed cost items.

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Pennsylvania has been relatively stable during the demonstration period, there have been many changes of ownership through bank mergers. DFSAS staff use the data base from the FNS-250s and canceled ATPs to generate invoices for issuance office payment each month. The invoices record the number of exchanged ATPs and any adjustments to fees to recoup losses (e.g. coupon overissuances). The PDPW Comptroller's Office and the State Treasury Department process the invoices to produce the checks, which are mailed by DFSAS. DFSAS also has a full-time staff person who audits each issuance office every three years.

Estimated ATP Transaction Cost. The total cost of exchanging the ATP cards for coupons under the regular ATP/coupon system in Berks County is \$1.27 per case month (see Exhibit 3-3). Together with the coupon supply costs presented above, this makes the total cost of benefit delivery under the ATP/coupon system \$1.60 per case month.

Nearly all of the ATP transaction cost is the \$1.10 fee per ATP, which translates into \$1.19 per case month because of supplemental and replacement issuances. This fee was raised in July 1985 from \$1.00 per ATP. The remaining cost includes DPSAS labor, PDPW Comptroller's office costs, and PDPW indirect costs.

DELIVERING BENEFITS TO RECIPIENTS: EBT SYSTEM

The EBT system eliminates the entire benefit delivery process used in the ATP/coupon system, including the ATP card and the paper food stamp coupons. Recipients obtain their benefits at the point of purchase by presenting the EBT card and entering their PIN code. They cannot normally gain access to benefits without the electronic system, including the central computer, the store terminal, and the lines connecting them. Thus, the benefit delivery process in the EBT system consists of all the tasks required to make the system available to process purchase transactions and provide recipients with balance information.

There are two basic components of the EBT benefit delivery process. First, EBT Center computer operators maintain the availability of the EBT computer system to process purchases and other transactions on a 24-hour basis. Second, field service technicians install and maintain the benefit transaction terminals, balance inquiry terminals, and printers in the

participating food stores. During the original demonstration, these technicians were full-time PRC staff.

The EBT Center. EBT system operators spent a substantial amount of time maintaining system availability. Time spent monitoring normal system operations (i.e. not responding to problems or running batch processing jobs) amounted to over 453 hours in October 1985, over 31 percent of all EBT staff work time. Some of this was essentially idle time, although it was unavoidable because an operator had to be available at all times in case of a problem. EBT operators also processed manual sales transactions when equipment malfunctioned or when route vendors made EBT sales. Only four hours were spent on manual sales in October 1985.

Retailer Equipment. The retailer equipment service functions also consumed a considerable amount of EBT Center staff time during the demonstration. In October 1985, over 20 percent of all EBT Center staff time was spent maintaining the terminal network. The three field service technicians spent about two-thirds of this time servicing BTTs and printers in the stores or in the office. An EBT operator would generally attempt to resolve any retailer problem over the telephone before dispatching a technician. If a technician was necessary, he or she went to the store, diagnosed the problem, and replaced the defective unit if necessary. The technicians repaired the equipment in the EBT Center Annex or returned the equipment to the manufacturer for service. The technicians also delivered printer paper and other supplies to stores and ran errands (such as picking up issuance tapes at OIS).

Estimated Benefit Delivery Cost. The extensive resources devoted to benefit delivery in the demonstration EBT system resulted in a cost of \$21.63 per case month for this function. As Exhibit 3-3 shows, the labor cost for this function was \$7.26 per case month, including EBT Center staff and PRC headquarters staff. The non-labor cost of \$14.36 per case month included \$6.81 for the store equipment leases, as well as an 80 percent share of the other equipment costs and communications costs. (As explained in Appendix III-D (p. III-19), the computer equipment and communications costs were allocated among issuance functions in proportion to the time spent on each function by EBT Center staff.) The high cost per case month of store equipment was attributable in large part to the large number of terminals deployed--an average of 1 for every 13 households in the demonstration, not including spares.

CREDITING RETAILERS: ATP/COUPON SYSTEM

Retailers request credit for purchases made with food stamp coupons by completing a food stamp Redemption Certificate and submitting it and the coupons to a bank. The bank credits the retailer for the deposit, bundles it together with other food stamp deposits, completes a Food Coupon Deposit Document, and submits all of these materials to a branch of the Federal Reserve Bank. The retailer and the bank bear these costs as part of the normal cost of business; there is no charge to the government.

Under an agreement with FNS, the Federal Reserve branch counts the coupons (sampling the \$1 dollar coupons and counting each coupon of higher denomination), compares this count to the deposit documents, and checks for counterfeits before destroying the coupons. The Federal Reserve branch then credits the depositing bank and submits a debit voucher against the USDA account at the United States Treasury. The Redemption Certificates, deposit documents, and debit vouchers are sent to the FNS data processing center in Minneapolis, Minnesota.

Estimated Crediting Cost. FNS pays the Federal Reserve system \$12,000,000 per year for these food stamp processing services. As shown in Exhibit 3-4, this fee represents a cost of \$0.136 per case month. FNS also bears the cost of monitoring the debit vouchers, processing the payment to the Federal Reserve, and monitoring the Federal Reserve's performance under the agreement. These activities, which are carried out by the Accounting Division, add only \$0.005 per case month to the cost of crediting retailers.

CREDITING RETAILERS: EBT SYSTEM

The EBT system eliminates the processing of coupons, Redemption Certificates, and Food Coupon Deposit Documents to credit retailers. Instead, the EBT system accumulates credits to retailers electronically and uses the Automated Clearing House (ACH) network to transfer funds from the letter of credit established for the demonstration to retailers' bank accounts.

The EBT system creates a record of a credit to the retailer when it processes a purchase transaction. The retailer crediting process begins when, shortly after 2:00 PM each weekday, the EBT operator runs a program ("bundle-

Exhibit 3-4

**Cost of Crediting Retailers for Purchases with Food Stamp Benefits:
ATP/Coupon System vs. EBT System**

<u>Item</u>	<u>ATP/Coupon System Cost per Case Month</u>	<u>EBT System Cost per Case Month</u>
Labor to bundle up purchases and submit to bank for credit	(no cost to govt.)	\$0.111
Other purchase bundle-up costs	<u>(no cost to govt.)</u>	<u>0.105</u>
Total purchase bundle-up costs	(no cost to govt.)	\$0.216
Federal Reserve/ACH fees for processing food stamp credits and debiting USDA	\$0.1363	\$0.224
FNS monitoring of debits and related costs	<u>0.0005</u>	<u>---</u>
Total cost of crediting retailers	\$0.137	\$0.440

Sources: FNS interviews, PRC cost reports, EBT Center time study, and PDPW cost report.

Note: See Appendix III-E for detailed cost items.

up") that totals all credits accumulated by each retailer and creates a tape of this file. During the demonstration, the operator delivered the bundle-up tape to the data processing department of American Bank and Trust, which served as the clearinghouse bank for interface with the ACH system.

The clearinghouse bank combines the EBT credit file with other files for entry into the ACH system. The credits pass through the the ACH system to the retailers' banks, where they are credited to the retailers' accounts. The clearinghouse bank requests a wire transfer to draw upon the letter of credit established for the demonstration by FNS at the Federal Reserve Bank of New York. PDPW reimburses the clearinghouse bank for the ACH charges.

Estimated Crediting Cost. The cost of crediting retailers in the EBT system was \$0.44 per case month, including EBT Center costs and the fees charged by AB&T to initiate the ACH transactions, as shown in Exhibit 3-4. The EBT Center cost of \$0.22 per case month reflects the relatively small amount of time (less than 1 percent of total staff time) spent in running the bundle-up program of retailer credits and answering retailer inquiries about deposits. The cost of ACH fees was \$0.22 per case month; AB&T charged \$5.00 per retailer account per month and \$5.50 per wire funds request against the letter of credit. There was no cost for the transfer of credit to retailers with accounts at AB&T, since these credits were not sent through the ACH system.¹

MANAGING RETAILER PARTICIPATION: ATP/COUPON SYSTEM

In the ATP/coupon system, FNS manages all aspects of the Food Stamp Program that involve food retailers, including retailer authorization and monitoring and the enforcement of redemption regulations. The management of retailer participation involves all levels of FNS, from the local field offices to the national administration, and includes several distinct branches of the agency.

¹While PDPW could not identify any cost for processing payments to AB&T, this function is comparable to the reimbursement of issuance offices. Only one interface bank was used in the demonstration (instead of the six issuance banks in Berks County). Therefore the cost of reimbursing AB&T was probably less than the \$0.006 per case month cost of managing and reimbursing issuance offices.

Authorizing Retailer Participation. A retailer wishing to participate in the Food Stamp Program contacts the nearest FNS field office to request an application. For Berks County and 16 other counties in the region, the FNS Philadelphia Field Office handles retailer applications. The field representative covering the retailer's area reviews the completed application and checks for any previously authorized stores on the site or under the same owner. During the original demonstration period, the field representative would visit the store to obtain additional information and determine whether the store was eligible. (Since April 1986, FNS policy has been for retailers to complete the application at a field office or in a group application session where appropriate.) If the store qualifies, the field representative notifies the owner, completes a record of the store visit, and submits the completed application and the contact report to the officer-in-charge.

Once the officer-in-charge approves the application, a secretary assigns a retailer authorization number to the store, types up the store's authorization card, and sends the retailer a participation kit (authorization card, food stamp regulations, Redemption Certificates and other materials). The secretary also enters the authorization number and data from the application onto the national retailer data base at the FNS Minneapolis Field ADP Center. Entering the retailer data signals the Minneapolis Center to send a supply of Redemption Certificates to the store.

If a store is not qualified, the field representative sends a standard letter of denial to the owner, including the reasons for denial, a sketch of the store layout, and notice of the owner's right to appeal the denial through the Administrative Review Division, a separate arm of FNS. The officer-in-charge reviews the denial letter before it is sent. Only three to five percent of applicants are denied at the Philadelphia Field Office, and very few stores appeal denials.

Monitoring and Sanctions. Field representatives visit authorized stores to monitor their compliance with program regulations, answer questions, and update data on the stores. A field representative may visit a store shortly after authorization to observe operations, check the staff's understanding of regulations, and note any changes in the store's inventory. Field representatives train store personnel in program regulations upon request.

The field offices are the first line in FNS's effort to detect store violations and implement sanctions. Field representatives review reports on store redemptions that identify stores with unusually high redemption levels. The field office also receives complaints about stores not complying with regulations. When a field representative has reason to believe a store is violating program regulations, he or she visits the store to determine if the store is in violation. The field representative files a report on the compliance visit, which may recommend monthly monitoring of the store's redemptions or investigation of the store by FNS's Compliance Branch. The officer in charge at the field office reviews the report and discusses the recommendation with the field representative before action is taken.

When the regional Compliance Branch office receives a request for an investigation, a staff investigator makes up to three attempts to buy ineligible items. In some areas, such as ethnic communities, the Compliance Branch employs a local resident as an aide to attempt prohibited transactions so that the retailer will not become suspicious. The Compliance Branch sends a report on the investigation to the Field Office and the Coupon Use and Redemption Unit (CURU) of MARO.

CURU coordinates the retailer sanction process if the Compliance Branch succeeds in making prohibited transactions. CURU sends the notice of charges to the store, reviews the case summary prepared by the field office, and sends a warning or notice of sanction to the store owner. (The sanction may be a suspension or termination of participation, or a fine.) If the retailer appeals the sanction (as most do, because the penalties are substantial), CURU prepares the case materials for the Administrative Review Officer. The officer hears the case and either sustains, reduces, or lifts the sanction. CURU notifies the retailer of the decision of the review officer. The administrative review (or judicial appeal of the administrative review) may require additional data collection by the field office to determine the impact of sanctions on recipients. Once the retailer has exhausted the options for appeal, CURU implements the sanction process, including fine payment schedules, instructions to the field office to retrieve the store authorization card, and notification to banks and the press.

If the Compliance Branch or other enforcement agencies suspect that a participating retailer or an unauthorized party is engaged in large-scale

violations of redemption regulations (especially discounting food stamps for cash), the USDA Office of Investigations within the Office of the Inspector General (OIG) becomes involved in the case. OIG, like the Compliance Branch, uses undercover investigations to catch violators. OIG cases generally lead to arrest and criminal prosecution if significant violations are found, although violators also may receive civil sanctions.

Other Retailer Management Activities. The Minneapolis Field ADP Center (MFDC) maintains the national data base on retailer participation, redemptions, and bank activity in the Food Stamp Program. The MFDC updates this data base using the Redemption Certificates, Food Coupon Deposit Documents, and debit vouchers completed during the redemption process. Various branches of FNS use MFDC reports to track overall patterns of food stamp redemption and to monitor retailer and bank compliance. The MFDC also numbers blank Redemption Certificates and supplies them to retailers.

In the FNS national office, three units are involved in managing retailer participation. The Automated Data Management and Analysis Section monitors and validates the MFDC data base as part of its responsibility for generating food stamp use reports. The Retailer Participation and Litigation Section maintains food stamp redemption regulations and forms and provides policy interpretations. The Retailer-Wholesaler Section tracks the operational performance of the food stamp redemption system and recommends corrective actions.

Estimated Retailer Management Costs. Although the conventional system for managing retailer participation involves many actors, it does not carry a high cost. As Exhibit 3-5 shows, the entire system costs about \$0.14 per case month. Over one-third of this cost (\$0.052 per case month) is the field office cost for all of its retailer management functions, which represent about 50 percent of the total Philadelphia Field Office operating cost. The next largest component is the Compliance Branch, whose operations cost \$0.038 per case month nationwide, including regional offices, national administration, and indirect costs. Despite the large volume of forms and data processed by the MFDC, the cost of the redemption monitoring data base is only \$0.02 per case month, including MFDC and ADMA costs.

MANAGING RETAILER PARTICIPATION: EBT SYSTEM

In contrast to the other functions, the retailer management function in the EBT system is largely the same as in the ATP/coupon system. The Phila-

delphia Field Office authorizes new retailers and monitors compliance through store visits and redemption data. The CURU at MARO is still responsible for overseeing the field office's compliance activities, although it has generally delegated its Berks County responsibility to the MARO EBT Coordinator.

Nevertheless, there have been some differences in FNS retailer management activities in the EBT system. The Compliance Branch withheld action on requests for investigations, expecting that the demonstration would end in December 1985 and stores would return to the coupon system. (The Compliance Branch made arrangements with PDPW to investigate participating stores in the spring of 1986 after the demonstration was extended.) The Philadelphia Field Office notifies the EBT staff of new retailers in the demonstration area and has occasionally intervened to facilitate the installation of EBT equipment in new stores. During the early part of the demonstration, the Berks County field representative also handled questions about the EBT system during store visits, adding 10 to 15 minutes to each visit in the

[REDACTED]

ing. Because there are no Redemption Certificates or deposit documents, the MFDC does not enter the store's redemption data in the usual way. Instead, the EBT Center produces a weekly store redemption tape which a MFDC programmer reads directly into the redemption data base.

During the original demonstration, EBT Center and other PRC staff had other retailer administration and liaison responsibilities. The EBT project staff maintained close contact with retailers and worked with them to resolve various problems, such as reconciling accounts. EBT staff also per-

Exhibit 3-5

Cost of Managing Retailer Participation:
ATP/Coupon System vs. EBT System

<u>Item</u>	<u>ATP/Coupon System Cost per Case Month</u>	<u>EBT System Cost per Case Month</u>
FNS field office costs	\$0.052	\$0.067
FNS regional office costs	0.017	0.017
FNS compliance branch costs	0.038	0.038
FNS administrative review division costs	0.012	0.012
FNS/PRC redemption data processing system costs	0.020	0.311
FNS retailer policy and redemption system oversight costs	<u>0.005</u>	<u>0.005</u>
Total retailer participation management cost	\$0.144	\$0.450

Sources: FNS interviews and data, PRC data, EBT Center time study.

Note: See Appendix III-E for detailed cost items.

operations. (The cost of PRC's general retailer liaison activities is included in the overall management and trouble-shooting time.) The cost of regular FNS activities that continued during the demonstration was \$0.14 per case month, including \$0.067 for the Philadelphia Field Office and \$0.017 for MARO. The PFO cost was \$0.017 per case month higher under the EBT system because of the extra time spent during store contacts. The MARO, Compliance Branch, and Administrative Review costs (totalling \$0.067) did not actually apply during the demonstration because of the decision to defer investigations, but would be expected normally.

RECONCILIATION AND MONITORING: ATP/COUPON SYSTEM

Reconciliation and monitoring activities in the ATP/coupon system attempt to detect and correct errors and other problems in benefit issuance. The activities under this function focus on the FNS-46 and FNS-250 reports, which require reconciliation of ATPs and food stamp coupons against each other and against the client Master File.

State Agency Activities. At PDPW, the OIS Production Control section begins the reconciliation process by sorting the canceled ATPs sent in by issuance offices, together with special header cards summarizing the number and amount of the ATPs. A computer operator feeds the trays of canceled ATPs into the same IBM 370 computer system that prints and punches the ATPs. The operator also reads uncanceled ATPs returned by the Post Office (after they have been voided by the mailroom). Damaged ATPs that cannot be read are sent to an outside vendor for key entry.

If the canceled ATPs balance with the header cards, the operator runs the file produced by the IBM against the file of FNS-250 data input by a keypunch service. This procedure verifies the total issuances reported by each issuance office on the FNS-250 against the actual canceled ATP total. Production Control staff attempt to resolve discrepancies by checking for data entry or card reading errors. Nearly all inconsistencies between the FNS 250 file and the canceled ATP file are resolved in this way; the remainder are turned over to the Division of Food Stamp Administrative Services (DFSAS) for resolution. DFSAS contacts several issuance offices each month to resolve discrepancies between the actual ATP total and the FNS-250; this process may require several telephone calls before the discrepancy is resolved. OIS updates each bank's issuance history file once the ATPs and FNS-250s are reconciled.

OIS compares the final canceled ATP file to the records of issued ATPs created by the issuance process. This program identifies canceled ATPs that do not have a match in the issuance file. ATPs that lack a match include expired ATPs from a previous month, counterfeit ATPs, and multiple cancellations (cases in which both the original ATP and the replacement were exchanged).

DFSAS uses the results of the reconciliation runs to prepare the reports required by FNS, including the FNS-46 and FNS-250 reports for each county. Every six months, DFSAS uses the reconciliation results to bill issuance offices for losses, including transaction of expired ATPs and coupon overissuances. The charges for losses are deducted from the issuance offices' fees. Issuance offices rarely dispute the charges.

When the reconciliation process identifies a case in which duplicate ATPs were exchanged, Production Control sends a three-part report to the County Assistance Office, together with copies of the ATPs. A clerk at the CAO checks the client file, refers the case to the assigned caseworker, and files a copy of the report. The caseworker investigates the case, determines whether it is actually a multiple cancellation, and enters the results on the multiple-cancellation report.¹ If it is a multiple cancellation, the caseworker completes an overpayment control card and refers the case to the special unit that investigates overpayments. This unit files a claim for the amount of the overpayment against the recipient if it is determined that the recipient was responsible for the multiple cancellation.

Regional Office Activities. MARO monitors the PDPW reconciliation process at several levels. The Coupon Issuance and Accountability Unit (CIAU) monitors the submission of the FNS-46 and FNS-250 reports and validates them. CIAU also receives, dates, and batches the FNS-250 reports for key entry into the national FNS-250 data base by a vendor. The Program Analysis and Support Unit (PASU) receives, dates, and batches the FNS-46s for key entry by a vendor into the national FNS-46 data base. PASU also enters the FNS-46 data onto a microcomputer at MARO.

¹Often an apparent multiple issuance is the result of errors in reading the ATP or in keypunching a damaged ATP.

The primary activity of CIAU is reviewing state food stamp issuance systems. Teams of two Food Program Specialists completely validate one FNS-46 report for each state in the region every two years. The review teams study the reports used by the state to generate the FNS-46 and replicate the reconciliation process through on-site data collection. For a large state like Pennsylvania, the review takes about two and a half weeks, including time spent on site and at MARO. CIAU also conducts special reviews if the reconciliation reports show that a state is experiencing an excessive level of problems. The last special review of PDPW took place in 1983, when problems in the reporting of duplicate ATPs were resolved.

MARO receives an account statement for each issuance point every six months from the national office, based on the FNS-250 reports and shipment reports from the coupon distribution contractor. MARO reviews the statement briefly (unless the statement indicates a discrepancy over shipments) and sends it on to the State. If the statement indicates a discrepancy over coupon shipments, CIAU staff verify and adjust the bill by retrieving the hard copy of the FNS-250s and examining them and the attached shipment forms. If there is still a discrepancy, CIAU forwards the statement to the State with a note requesting that the state provide additional information if the statement is disputed by the issuance point. Over half of the shipping discrepancies are resolved by MARO, which adjusts the statements accordingly.

For each state, CIAU prints out a statement of losses reported in the FNS-46 data on MARO's microcomputer every six months and sends the statement as a bill to the State. CIAU may adjust the computerized statement if the file indicates special information on the original FNS-46 reports. CIAU also produces analytic reports on issuance losses from the FNS-46 data.

National Office Activities. Several FNS units at the national level have responsibility for post-issuance reconciliation and monitoring in the ATP/coupon system. Analysts and computer operators of the Information Resources Management Division (IRMD) maintain the FNS-250, FNS-46, and FNS-259 (mail issuance report) data bases at the Washington Computer Center. IRMD staff also procure the reconciliation reporting forms. The Automated Data Management Analysis Section produces reports from the FNS-46 and FNS-259 data bases. The Program Information Division monitors and validates the FNS-250 data base and uses it for reporting. The Program Development Division promul-

gates regulations and policy for the issuance process. Finally, the Program Accountability Division monitors State issuance performance and regional office efforts to improve that performance.

Estimated Reconciliation Cost. The cost of the entire ATP/coupon reconciliation and monitoring process is \$0.21 per case month, as shown in Exhibit 3-6. Nearly \$0.18 of this cost represents the labor and equipment costs for PDPW's reconciliation efforts. (This figure does not include the local assistance office labor, which was included in other ATP problem-solving because it could not be separated out.) Data processing time, including operator labor, cost of equipment, and environment costs, constitutes about half of the total PDPW reconciliation cost. FNS monitoring and data processing at the regional and national levels add only \$0.035 per case month. Most of this cost is the MARO cost for issuance reviews and maintaining the flow of reconciliation reports.

RECONCILIATION AND MONITORING: EBT SYSTEM

Three major reconciliation processes occur in the demonstration EBT system: issuance reconciliation, account and transaction reconciliation, and retailer credit reconciliation. Account and transaction reconciliation is an internal process involving only the EBT Center; the other processes require an interface between the EBT Center and the conventional food stamp reconciliation system.

Issuance Reconciliation. The EBT Center creates a file of issuances each time the recipient accounts are updated, using the same format PDPW uses for its ATP reconciliation files. Twice each month the EBT Center combines these files onto a tape, which a staff member delivers to the OIS computer center. The OIS Computer Systems Analyst assigned to the EBT project checks the tape and combines the EBT issuance file with the ATP issuance files to perform the statewide issuance reconciliation. Occasionally, OIS encounters problems reading the EBT tape and has to request a replacement tape.

Account Reconciliation. The EBT Center produces a Daily System Reconciliation Report that covers recipient activity, retailer activity, and activity by PDPW and the clearinghouse bank. This procedure checks each recipient's balance in the system's Master File against account activity, balances retailers' sales against the deposits to their bank accounts, and

Exhibit 3-6

Cost of Reconciliation and Monitoring of Issuance System:
ATP System vs. EBT System

<u>Item</u>	<u>ATP System Cost per Case Month</u>	<u>EBT System Cost per Case Month</u>
PDPW labor for reconciliation processing, problem resolution, reporting and monitoring	\$0.043	\$0.246
Other PDPW reconciliation and monitoring costs	0.135	0.116
Regional office labor for coupon ordering and reconciliation system and issuance monitoring	0.020	---
Other regional office reconciliation and monitoring costs	0.010	---
PRC labor for reconciliation and reporting functions	---	1.354
Other PRC reconciliation and reporting costs	---	1.269
FNS national-level reconciliation and monitoring labor	0.002	0.128 ^a
Other FNS national-level reconciliation and monitoring costs	0.003	---
Total reconciliation and monitoring cost	\$0.213	\$3.113

^aFNS national-level reconciliation and monitoring labor for EBT system includes overhead and non-labor costs.

Sources: FNS interviews and data, PDPW interviews, PRC data, EBT center time study.

Note: See Appendix III-E for detailed cost items.

reconciles the day's net debits against net credits. The procedure generates reports on recipient and retailer activity and on the flow of funds into and out of the system. At the time of the EBT Center time study, the procedure took approximately 30 minutes each day (under normal conditions). EBT staff also reconcile the day's retailer credits against an acknowledgment report from the clearinghouse bank reflecting the credits entered into the ACH system.

Other EBT System Actions. The EBT system also produces monthly summary reports, archive tapes of the system's history file, the retailer activity tapes, and special audit reports. The EBT system operators run these processes as they do all other batch processing jobs. During the demonstration, the EBT Center supervisor and PRC headquarters staff became involved in these tasks when processing problems arose, or when reconciliation identified discrepancies that operators could not resolve.

FNS/PDPW Monitoring. Special staff assigned to the EBT demonstration at MARO, the FNS Demonstrations Branch, and PDPW monitor EBT system operations in a number of ways. The MARO EBT Coordinator acts as a liaison between PDPW and the Demonstrations Branch staff, collecting and relaying information about PDPW and BCAO activities. He also monitors issuance and transaction reports submitted by PDPW. These tasks require three hours of his time each week. Staff of the Demonstrations Branch monitor all aspects of the EBT Center's performance and reports from PDPW, the Minneapolis Data Center, and the Treasury on the flow of benefits through the system. The EBT Coordinator at PDPW monitors and facilitates the involvement of OIS, BCAO and other PDPW units in the demonstration, spending half of her time on these tasks.

Estimated Reconciliation Cost. The cost for all of the EBT reconciliation monitoring activities described above was \$3.11 per case month, as presented in Exhibit 3-7. Most of this cost (\$2.62) was associated with EBT Center activities to perform the system reconciliation functions. The EBT Center labor and overhead cost of \$1.35 per case month for reconciliation and monitoring functions included several types of activities. The most important of these was the checking of reconciliation reports and extract reports. The PDPW cost for reconciliation and monitoring was \$0.36 per case month, of which \$0.24 was the cost of the EBT Coordinator's time. The FNS cost to monitor the

Exhibit 3-7

Summary of Costs by Function: ATP and EBT Systems

Function	ATP Cost per Case Month	EBT Cost per Case Month
Authorizing access to benefits	\$0.824	\$1.592
Delivering benefits to recipients	1.601	21.625
Crediting retailers for purchases	0.137	0.440
Managing retailer participation	0.144	0.450
Reconciliation and monitoring	<u>0.213</u>	<u>3.113</u>
Total cost per case month	\$2.919	\$27.220

Sources: Exhibits 3-1 through 3-6.

letter of credit (including labor and associated indirect costs) was \$0.13 per case month. (MARO and other Demonstrations Branch costs were considered part of the evaluation cost, not operating costs.)

SUMMARY OF OPERATING COSTS

The total operating cost of \$27.22 per case month for the EBT system was over nine times the total cost of \$2.92 per case month for the ATP/coupon system. As Exhibit 3-7 shows, the operating cost of the EBT system exceeded that of the ATP system for each of the five functions performed. The difference in cost between the two systems varied from a minimum of \$0.30 per case month for crediting retailers to a maximum of \$20 for benefit delivery, which was the most expensive function in both systems.

Given the limited data available to break down the EBT system costs by time and by task, it is difficult to explain fully the great discrepancy in cost between the two systems. A number of factors seem to have contributed:

- Some of the EBT system functions are intrinsically more costly than their ATP system counterparts. Photo ID production requires more equipment and effort than paper ID preparation. The EBT system shifts some retailer crediting costs from the stores and banks to the government. In the case of ID card costs, the frequency of lost and damaged cards exacerbated the effect of a more costly process. (Even if more durable cards were more expensive, they would probably be more cost-effective.)
- The small scale of the EBT system relative to that of the ATP system, meant that some relatively fixed costs, such as operator time for monitoring normal system operations, were spread over fewer cases than they would be in a permanent system. Other costs, such as EBT Center equipment, were not truly fixed but probably would rise less than proportionally with an increase in caseload.
- The stand-alone configuration of the EBT system meant that staff, computers, and terminals were not used for other purposes (with which costs could be shared).
- The EBT system was designed and run as a model for demonstration purposes. It had special tracking and reporting features that added to the expense of operating the system. Labor costs were high because of the high level of attention to participant needs and the seniority of project staff. The equipment was leased on a short-term basis instead of being purchased.

It is clear that the cost of the Reading EBT system was higher than a non-demonstration system would be. FNS approved the extension of the demonstration because PDPW successfully argued that dramatic reductions in cost were possible. It is too early to provide definitive measures of PDPW's operating cost for the extended demonstration, but it is possible to construct realistic scenarios for non-demonstration EBT configurations. In the next section, several such scenarios are presented to illuminate the factors that will determine if an EBT system can be as cost-effective as the ATP/coupon system.

3.3 OPERATING COSTS OF A NON-DEMONSTRATION EBT SYSTEM

In comparing the operating cost of the Reading EBT system to that of the ATP/coupon system, we found that the total EBT system cost of \$27 per case month greatly exceeded the cost of the ATP system. It is clear that an EBT system with lower administrative costs is feasible. The important question is how low EBT operating costs can be, and under what circumstances.

Other EBT systems could be less expensive to operate than the original demonstration system for three reasons. First, the original EBT system was designed and implemented for a 15-month demonstration. Some of the costs reflected the special constraints of this demonstration environment. Second, the small caseload participating in the EBT system meant that economies of scale were not realized. Finally, the operating cost of an EBT system would be reduced if facilities were shared with other public or commercial uses.

This section assesses the potential for cost savings implied by each of these possibilities by developing scenarios for hypothetical EBT systems. First, the original demonstration cost is compared with the cost of a hypothetical "stand-alone state EBT system" modeled on PDPW's approach during the early phases of the extended demonstration. In the "stand-alone state system" scenario, the EBT system uses dedicated computers and terminals (as did the original demonstration system), but staff are shared with other operations and the equipment is purchased, not leased. Second, the operating cost is estimated for hypothetical "integrated state EBT systems" serving varying caseloads: a small city, a major city, and a large state. In the "integrated state system" scenarios, the EBT system shares computer facilities

(as well as staff) with other operations. Finally, several scenarios are developed for the cost of a food stamp EBT system that is combined with a commercial point-of-sale (POS) system.

The cost projections for these scenarios are subject to varying degrees of uncertainty. The estimate for the "stand-alone state system" draws primarily on PDPW's early cost reports for the extended demonstration. Data on commercial POS systems have been used, where available, for the hypothetical system estimates. In many cases, however, it has been necessary to make assumptions that cannot be verified empirically. These assumptions are discussed in detail (together with the individual components of the cost estimates) in Appendix III-F (pp. III-36-49). Where the results are particularly sensitive to the assumptions, low and high cost estimates are presented.

OPERATING COST OF A STAND-ALONE STATE EBT SYSTEM

The extension of the EBT demonstration provides an opportunity to isolate some of the special operating costs incurred during the original demonstration. Under the initial phase of the extended demonstration, PDPW operates the hardware and software used by PRC and serves the same recipients and retailers. Thus, the extended demonstration system is comparable in many ways to the original demonstration system.

Three key features of the extended demonstration system differ from those of the original EBT system:

- The EBT center is located within the OIS computer center and operated by regular OIS staff. The computer operators and other staff divide their time between EBT tasks and other responsibilities, eliminating idle time. Some retailer service functions are handled by BCAO staff, who also have other responsibilities.
- FNS funded a buy-out of the previously leased EBT equipment, eliminating the largest component of the original demonstration cost.
- The stability of the EBT system enables PDPW to use less senior management and technical labor for EBT operations.

The extended demonstration provides the basis for constructing a scenario for a "stand-alone state EBT system". Under this hypothetical

scenario, a state would serve the same client and retailer base as in Reading, using the same hardware, software, and procedures. However, the state would purchase the equipment new instead of leasing the equipment. The system would be "stand-alone" in the sense that the computers and terminals would be used only for the EBT system. The state would locate the EBT Center within an existing computer facility (as in the extended demonstration) to share personnel and space with other operations.

Exhibit 3-8 compares the projected operating cost for the stand-alone state EBT system with the original EBT system operating cost. The purpose of this comparison is to highlight the effects on the cost of (1) moving the EBT Center into an existing operation and (2) shifting from a demonstration cost structure to a normal state cost structure. The labor and other non-capital costs for the stand-alone state system are estimated from PDPW cost reports for the early months of the extended demonstration. The equipment costs represent the monthly payments to amortize the estimated new purchase cost over a normal depreciation period, including interest for the state's cost of funds.¹

The extended demonstration cost data were adjusted so that the stand-alone state system projections would be as comparable as possible to the original demonstration cost. Some items, such as supplies and equipment for benefit card production, had to be added because they were not included in the PDPW cost reports. These costs were assumed to be the same as in the original demonstration. Labor costs were also adjusted where the PDPW cost reports did not reflect tasks included in the original demonstration cost. Appendix III-F (pp. III-36-49) explains the projections for the stand-alone state system and presents line-item detail in Exhibit III-F1 (p. III-37).

The cost projections for the stand-alone state system should be treated as an analytic exercise. The projections do not accurately represent the actual extended demonstration's cost, since the data are from the early months and lack independent verification. Further, the stand-alone state system is not necessarily a realistic scenario for a permanent EBT system, since a state might not buy dedicated computers for such a small system.

¹This interest is not reimbursable under Food Stamp Program regulations, but it is a real cost to the taxpayers.

Exhibit 3-8

**Monthly EBT System Operating Cost:
Original Demonstration vs. Stand-Alone State System**

<u>Cost Element</u>	<u>Original Demonstration Cost Per Month</u>	<u>Stand- Alone State System</u>
<u>Food Stamp Program Costs:</u>		
State and local agency labor	\$ 3,506	\$ 7,931
Other state/local agency costs	1,621	1,231
FNS retailer management, reconciliation and monitoring	<u>970</u>	<u>970</u>
Total Food Stamp Program costs	\$ 6,097	\$10,132
<u>Data Base/EBT Center Costs:</u>		
Labor	\$24,130	\$ 7,302
Computer and peripherals	13,845	3,877
Other costs	<u>10,139</u>	<u>4,525</u>
Total Data Base/EBT Center cost	\$48,113	\$15,704
<u>Terminal and Communications Costs:</u>		
Store equipment and service	\$29,984	\$15,853
EBT phone lines	4,302	3,630
Other costs	<u>3,530</u>	<u>1,438</u>
Total Terminal/Communications cost	\$37,815	\$20,921
Total — all costs	\$92,026	\$46,758
Cost per case month	\$ 27.22	\$ 13.83

Sources: Original demonstration cost - FNS and PDPW interviews, BCAO and EBT Center time studies, PDPW data, PRC data. Extended demonstration-PDPW cost reports, FNS data, estimates for original demonstration cost. Caseload - late demonstration level (3,381).

Note: See Appendix III-F for detailed cost items and estimation procedures.

The EBT system operating costs in Exhibit 3-8 are divided into three major functions. The first, Food Stamp Program functions, are the special activities required by the Food Stamp Program, including recipient services and retailer management. The state and FNS carry out these functions in the stand-alone state system scenario, much as they did during the original demonstration (except for added state reporting responsibilities). The data base/EBT Center functions are those performed by the central EBT computers, including transaction processing, retailer crediting, client account updates, and reconciliation and reporting of EBT system activity. Retailer interface and the retailer hotlines are included in the data base/EBT Center costs. The

stration system. It is also clear, however, that removing the special costs associated with leased equipment and a demonstration contractor does not automatically bring EBT costs in line with ATP/coupon costs. As the following section shows, the small scale of the Reading EBT system and its stand-alone design made it inherently more costly than the ATP/coupon system.

OPERATING COSTS OF A LARGER-SCALE INTEGRATED EBT SYSTEM

One reason for EBT system's high cost, even in the above scenario, is that 3,400 recipient households are too few to allow major economies of scale. Most EBT Center labor costs--running batch programs, reporting procedures, and management--are relatively independent of the number of households in the system. The equipment itself is idle a substantial portion of the time because the food stamp purchases are concentrated in the first two weeks of the month under current issuance procedures. Even if purchases were more evenly distributed (e.g., if regular issuances were spread throughout the month), the terminals would be underutilized because of the small scale of the demonstration.

In the second phase of the extended demonstration, PDPW plans to transfer EBT operations to its own equipment, sharing fixed equipment and overhead costs with other programs. PDPW expects the EBT system to require less labor after the transfer, because operations will be more fully automated and because the equipment is designed to avoid slowdowns and crashes. Furthermore, the move will allow PDPW to expand the EBT system to larger areas, with minimal change to the EBT Center equipment, thus spreading the remaining fixed costs over a larger caseload.

PDPW's plans provide a model for what we term an "integrated state EBT system", integrated in the sense that it shares both staff and central computer equipment with other state operations. However, it is used only for state purposes, and the terminal/communications network is used only for food stamp transactions. This is a more realistic scenario than the stand-alone state system, especially for a state that prefers to implement an EBT system on a small scale at first and then expand it.

This section presents operating cost projections for integrated state EBT systems at three levels of operation: a small city with 5,300 recipient households (modeled on Berks County); a major city with 130,000

recipient households (modeled on Philadelphia); and a large state with 400,000 recipient households (modeled on Pennsylvania). These levels of scale were chosen to illustrate the relative importance of fixed and variable costs in overall EBT operating costs. The projections also show the savings resulting from integration of computer facilities with other state operations.

The principal sources for these projections are early PDPW estimates of data base costs and evaluation estimates of Food Stamp Program and terminal/communication costs. Key parameters for the three levels of operation (number of retailers by type, number of households, number of assistance offices) were based on FNS and PDPW data. Appendix III-F (pp. III-40-44) provides additional detail on the data sources and assumptions for the integrated system projections.

Because the projections are sensitive to assumptions about the intensity of terminal use and the economies of scale, two sets of estimates are presented. The high-cost scenario limits the intensity of terminal use (thus requiring more terminals) and assumes few economies of scale in data base costs. The low-cost scenario allows more intense terminal use in high-density areas and assumes more substantial economies of scale in data base costs.

High-cost scenario. Exhibit 3-9 shows the substantial savings that integration and increased scale can yield. The "small city" projection of \$9.85 per case month is substantially less than the stand-alone state system projection, even though the increase in scale is only 1,900 cases. Even with conservative assumptions about scale economies, these projections indicate additional savings up to the large state level. The \$7.54 per case month minimum under this scenario is nonetheless high in relation to the ATP/coupon cost.

The data base cost is a major factor in the projected savings. This cost component falls from \$4.64 per case month in the stand-alone system to \$0.55 in the integrated, large state-level system. This effect is primarily the result of integration, which permits even the small-city system to take advantage of the low cost per processing unit in a large, multi-program computer facility. The integrated system labor estimates also assume savings from smoother operation and some economies of scale in hotline operations and technical support. (See Exhibit III-F2 (p. III-42) for detailed projections of the high-cost integrated system scenario.)

Exhibit 3-9

Monthly Operating Costs for Integrated State EBT System:
High-Cost Scenario

<u>Cost Element</u>	<u>Cost for Small City System (5,300 HH)</u>	<u>Cost for Major City System (130,000 HH)</u>	<u>Cost for Large State System (400,000 HH)</u>
<u>Food Stamp Program Costs:</u>			
State/local agency labor	\$ 8,354	\$152,564	\$469,426
Other state/local costs	3,399	72,909	224,338
FNS costs	<u>844</u>	<u>18,850</u>	<u>58,000</u>
Total Food Stamp Program costs	\$12,597	\$244,323	\$751,764
(Cost per case month)	(2.38)	(1.88)	(1.88)
<u>Data Base Costs:</u>			
Labor	\$ 6,790	\$ 14,957	\$40,836
Computers and peripherals	1,748	42,858	131,870
Other costs	<u>1,576</u>	<u>18,964</u>	<u>45,097</u>
Total Data Base cost	\$10,114	\$76,779	\$217,803
(Cost per case month)	(1.91)	(0.59)	(0.55)
<u>Terminal/Communications Costs:</u>			
Store equipment and service	\$21,938	\$542,123	\$1,668,010
EBT phone lines	5,316	97,254	218,482
Other costs	<u>2,229</u>	<u>52,985</u>	<u>157,997</u>
Total Terminal/Communications cost	\$29,483	\$692,362	\$2,044,489
(Cost per case month)	(5.56)	(5.33)	(5.11)
Grand Total EBT cost	\$52,194	\$1,013,465	\$3,014,056
(Cost per case month)	(9.85)	(7.80)	(7.54)

Sources: PDPW cost estimates, PRC cost data, BCO time study, PDPW/FNS interviews.

Note: See Appendix III-F for detailed item costs and assumptions.

Exhibit 3-9 shows virtually no difference in terminal/communications cost between the small-city system and the larger systems. Under the high-cost integrated system assumptions, the terminal/communications cost per case month depends on two characteristics: the total number of recipient households and the number of households per terminal required. For the high-cost scenario, it is assumed that a terminal is required for every 14 households, regardless of the density of the population and the distribution of stores.¹ Peak capacity needs and equipment wear problems might impose such a constraint.

This assumption virtually eliminates variation in the terminal/communications cost per case month. The only variation seen in Exhibit 3-9 is due to lower telephone costs per household, which are tied to the distribution of stores. There are more households per store in the major city and large state systems than in the small city.

Low-Cost Scenario. The projections in Exhibit 3-10 show the effects of relaxing key assumptions of the high-cost scenario in two areas: terminal requirements and data base labor. (These assumptions are discussed in Appendix III-F (pp. III-45-47). Details of costs for this scenario are projected in Exhibit III-F3 (p. III-46).)

Under the low-cost scenario, the terminal requirements are not fixed at 1 for every 14 recipient households. Instead, the projections assume that each store has the same number of terminals as the average store of that type (supermarket, grocery store, or other) in the Reading system. Thus, fewer terminals are needed where there are more households per store, or where supermarkets (which have the most terminals per store) are a smaller percentage of the stores.

As Exhibit 3-10 shows, the terminal/communications cost per case month for the large state system is much lower than for the small city system, and the \$2.96 cost for the major city is still lower. This low cost is achieved because of more intensive terminal use. The large state system has 24 households per terminal, and the major city has 29. The major city has a

¹The small-city system would have this ratio if it had the same number of retailers by type as Berks County and the same number of terminals per store by type as in the original demonstration. See Appendix III-F (pp. III-40-44) for further details on these assumptions.

Exhibit 3-10

Monthly Operating Costs for Integrated State EBT System:
Low-Cost Scenario

<u>Cost Element</u>	<u>Cost for Small City System (5,300 HH)</u>	<u>Cost for Major City System (130,000 HH)</u>	<u>Cost for Large State System (400,000 HH)</u>
<u>Food Stamp Program Costs:</u>			
State/local agency labor	\$ 8,354	\$152,564	\$469,426
Other state/local costs	3,399	72,909	224,338
FNS costs	<u>844</u>	<u>18,850</u>	<u>58,000</u>
Total Food Stamp Program costs	\$12,597	\$244,323	\$751,764
(Cost per case month)	(2.38)	(1.88)	(1.88)
<u>Data Base Costs:</u>			
Labor	\$ 6,790	\$ 10,080	\$17,600
Computers and peripherals	1,748	42,858	131,870
Other costs	<u>1,576</u>	<u>18,661</u>	<u>43,650</u>
Total Data Base cost	\$10,114	\$71,599	\$193,120
(Cost per case month)	(1.91)	(0.55)	(0.48)
<u>Terminal/Communications Costs:</u>			
Store equipment and service	\$21,938	\$259,034	\$992,060
EBT phone lines	5,316	97,254	218,482
Other costs	<u>2,229</u>	<u>28,489</u>	<u>99,484</u>
Total Terminal/Communications cost	\$29,483	\$384,777	\$1,310,026
(Cost per case month)	(5.56)	(2.96)	(3.28)
Grand Total EBT cost	\$52,194	\$700,699	\$2,254,911
(Cost per case month)	(9.85)	(5.39)	(5.64)

Sources: PDPW cost estimates, PRC cost data, BCAO time study, PDPW/FNS interviews.

Note: See Appendix III-F for detailed item costs and assumptions.

high ratio of households per store and a low percentage of supermarkets. The terminal/communications cost could be even lower if the requirement of a terminal for every checkout counter were relaxed.

The lower data base costs for the larger systems in the low cost scenario reflect more liberal assumptions about economies of scale in data base/EBT Center labor. In this scenario, all data base labor costs are fixed or rise more slowly than the caseload.

These assumptions lead to lower cost projections for the major city and large state systems. However, a comparison of Exhibits 3-9 and 3-10 shows that relaxing these assumptions only reduces the data base cost per case month by \$0.04 to \$0.07. It appears from these results that integration may be more important than economies of scale in reducing data base costs.

Even the hypothetical major city integrated EBT system does not reach the \$3 per case month cost of the ATP/coupon system. The chief reason is the substantial cost of fielding and maintaining the network of terminals and telephone lines exclusively for food stamp transactions. This cost would be substantially lower if the prices of the terminals and printers fell; industry sources indicate that some reduction is likely from the \$893 total (for terminal, PIN pad, and printer) used in these calculations. Some POS terminals now on the market are priced as low as \$200, although these lack the features of the equipment used in the demonstration system.¹

These results suggest that the cost of an EBT system would fall substantially if it is placed within a large-scale, multipurpose computer system, and even more if the system could be expanded without increasing labor costs. At the larger scale, however, the cost of dedicated terminals becomes the critical factor affecting the operating cost of an EBT system. The number of terminals required, the cost per terminal, and the expected life of the unit are critical variables that can determine whether such a system can compete on cost with the ATP/coupon system.

¹"The Frantic Race to Sell Terminals," POS News, August 1986.

OPERATING COST OF A "PIGGY-BACK" EBT SYSTEM

The cost for terminals in an EBT system could be reduced by linking the terminals to a commercial point-of-sale debit card system. One approach would be to "piggy-back" the EBT system onto the commercial system, whereby food stamp recipients could be issued cards for special accounts. (These accounts would contain only benefit information, not actual funds.) The commercial system would perform all data base and terminal functions for a fee. Sharing all terminals and data base facilities would permit the maximum economies of scale, so a "full piggy-back" system would presumably have the lowest cost per transaction.

Alternatively, the Food Stamp Program could maintain its own cards and accounts but use a combination of food stamp-only terminals and terminals installed by stores for a commercial system ("partial piggy-back"). This approach might be the only option if the available commercial systems had terminals only in the highest-volume locations. Such a situation is likely, given the high cost of buying and maintaining terminals. Maintaining a separate system of cards and a separate data base might also be desired for accountability or other policy reasons. (These options and issues are discussed in more detail in Chapter 8.)

Exhibit 3-11 projects operating costs for partial piggy-back EBT systems on the same three scales as the integrated state system -- small city, major city and large state -- and for a full piggy-back system. The key assumptions are:

- Food Stamp Program costs are the same as for the integrated EBT system except that, under the full piggy-back system, card issuance and related problems are handled by the system operator instead of the county assistance offices.
- All data base and terminal costs are covered by fees under the full piggy-back system. The fees are: \$1.50 per case to set up an account (one-time charge), \$0.15 per case per month to maintain accounts, \$0.07 per purchase for the system switch, and \$0.09 per purchase for the terminal owner's maintenance and telephone costs.¹

¹Source of fees for full piggy-back scenario: interview with Richard Urban, MAC network, May 20, 1986.

Exhibit 3-11

Monthly Operating Cost for Non-Demonstration EBT System:
"Piggy-Back" Scenario Estimates

Cost Element	Partial Piggy-Back: Small City (5,300 HH)	Partial Piggy-Back: Major City (130,000 HH)	Partial Piggy-Back: Large State (400,000 HH)	Full Piggy-Back: Small City (5,300 HH) ^a
<u>Food Stamp Program Costs:</u>				
State/local agency labor	\$ 8,354	\$152,564	\$469,426	\$ 1,693
Other state/local costs	3,399	72,909	224,338	1,066
FNS costs	<u>844</u>	<u>18,850</u>	<u>58,000</u>	<u>844</u>
Total Food Stamp Program costs	\$12,597	\$244,323	\$751,764	\$ 3,603
(Cost per case month)	(2.38)	(1.88)	(1.88)	(0.68)
<u>Data Base/EBT Center Costs:</u>				
Labor	\$ 6,387	\$11,686	\$ 24,758	(b)
Computers and peripherals	1,748	42,858	131,870	1,193 ^b
Other costs	<u>1,538</u>	<u>18,751</u>	<u>44,016</u>	<u>74</u>
Total Data Base/EBT Center costs	\$ 9,673	\$73,295	\$200,644	\$ 1,267
(Cost per case month)	(1.83)	(0.56)	(0.50)	(0.24)
<u>Terminal/Communications Costs:</u>				
Switch fees	\$ 1,307	\$ 10,340	\$119,028	\$ 2,968
Deployer fees	1,680	13,295	153,037	3,816
Store equipment and service	9,812	187,627	391,498	(b)
EBT phone lines	4,231	87,020	167,280	(b)
Other costs	<u>1,300</u>	<u>23,154</u>	<u>61,365</u>	<u>423</u>
Total Terminal/Communications costs	\$18,329	\$321,436	\$892,207	\$ 7,207
(Cost per case month)	(3.46)	(2.47)	(2.23)	(1.36)
Grand Total EBT cost	\$40,598	\$639,055	\$1,844,616	\$12,077
(Cost per case month)	(7.66)	(4.92)	(4.61)	(2.28)

^aWith full piggybacking, costs do not vary materially with the size of the food stamp caseload. (See Appendix III-F, p. III-49 for comment.)

^bFees to POS system operator cover data base labor and equipment, store equipment and service and phone lines.

Sources: PDPW cost estimates, PRC cost data, BCAO time study, PDPW/FNS interviews.

Note: See Appendix III-F for detailed item costs and assumptions.

- In the partial piggy-back system, the Food Stamp Program pays fees to a commercial system to deliver transactions from stores in the system (assumed to be all supermarkets). Fees for these transactions are the per-purchase fees in the full piggy-back scenario, totaling \$0.16 per purchase. The state deploys terminals in all other authorized retailers; as a terminal deployer, it can use the switch at no charge. PDPW performs the same data base/EBT Center functions as under the integrated system (transaction processing, account updates, retailer credit bundle-up, reporting).

The partial piggy-back scenarios offer savings of 10 to 20 percent from the low-cost integrated state EBT system estimates, or 20 to 40 percent compared with the high-cost estimates (Exhibit 3-11). The lowest cost under the partial piggy-back scenario is \$4.61 per case month for the large state system. The major city system cost under the partial piggy-back scenario is slightly higher (\$4.92 per case month), primarily because supermarkets make up a smaller share of all food stamp retailers there than statewide. The partial piggy-back cost for the small city (\$7.66 per case month) is quite high compared to the larger systems, but well under the \$9.85 case month cost for the integrated state system scenario.

The full piggy-back EBT system scenario offers the lowest operating cost: \$2.28 per case month. This is well below both the lowest estimate for an integrated state EBT system (\$5.39) and the operating cost of the ATP/coupon system in Reading (\$2.92). By sharing terminals and telephone lines with the commercial POS system, the Food Stamp Program saves a substantial amount.

The lower data base cost for the full piggy-back system also has a substantial effect on EBT costs at the small-city level, but the savings are smaller (\$0.26 to \$0.35 per case month) for the major city and large state systems. The larger systems have already achieved substantial savings in data base costs under the integrated state system scenario, so less can be gained by incorporating the EBT data base operation into a commercial POS system. This result suggests that small states may benefit more from a full piggy-back approach than large states (compared with the integrated state system).

Finally, these estimates indicate that the full piggy-back system would cost \$1.20 to \$1.70 per case month less in Food Stamp Program costs than an independent or partial piggy-back EBT system. These savings result from

the centralization of card encoding and other account set-up costs by the commercial POS operator. It is likely that the commercial operator will also provide less personal service than assumed under other scenarios.

The actual cost for a full or partial piggy-back EBT system would depend not only on the scale and the number of food-stamp-only terminals, but also on the pricing policy of the commercial POS system. There is no uniform pattern in the industry: in some cases, terminal owners pay a fee to the system switch operator, while in other cases the switch pays a fee to the terminal owner. Stores may be charged on a per-transaction basis only, or pay a lump sum to join a system and have equipment installed.

Data from other sources suggest that the full piggy-back cost projection may be low. A comparative study of the cost of payment mechanisms, including debit cards, estimated the full resource cost of a POS transaction in 1983 at \$0.60, including merchant handling as well as POS system labor, capital, and normal profit.¹ This would put the cost per case month (assuming 8 transactions per case, the average in the demonstration) at \$5.48, including the \$0.68 per case month in residual Food Stamp Program costs for a full piggy-backed system. However, this evaluation has estimated merchant handling costs for the EBT system (using a relatively broad definition) at around \$1.47 per case month. The remainder of the difference between the "full resource cost" estimate and our projection may be due to reductions in POS costs since 1983 or to the willingness of the quoted POS operator to provide services at cost in order to generate volume.

The simulations of large-scale EBT system costs do not include the costs of developing and implementing such a system. These costs would depend on the resources already available, such as the state's computer facilities, the capacity of existing POS networks, and the necessary software and hardware. The cost of \$2.3 million to design, develop and implement the Reading EBT system included \$1.2 million to develop a "custom-built" system. Development costs for a full piggy-back system, on the other hand, would be minimal, and the implementation cost would consist of setting up procedures for benefit updates, negotiating the necessary contracts, and recipient

¹Steven D. Felgran and R. Edward Ferguson, "The Evolution of Retail EFT Networks," New England Economic Review, July/August 1986, pp. 12-56.

training. These costs would probably be less than the \$320,000 in FNS and PDPW costs for EBT system design, development, and implementation, given the intensive monitoring required for the demonstration. A partial piggy-back system would have additional implementation costs, including terminal installation and training of retailers new to the POS environment.

In general, the implementation cost in a permanent setting would be proportional to the scale of the system, with equipment installation and recipient training the main costs. The PDPW/BCAO cost to train and equip the initial recipient population was around \$26 per case; the late demonstration cost was around \$9 per new recipient. One indication of the installation cost for POS equipment is the \$40 per installation charged to PDPW by the contract service agent under the extended demonstration. The cost for a large number of installations would probably be less, however, reflecting economies of time and equipment.

The preceding discussion highlights several important considerations. First, data base costs per case month for an EBT system are sensitive to the size of the system, and can fall to very low levels. These economies of scale are particularly great if the EBT system uses the facilities of a large government computer center serving many programs (such as the OIS data center) or a commercial POS/EFT system with a high transaction volume.

Second, Food Stamp Program costs per case month for an EBT system are likely to be relatively constant. There are some economies of scale in program management. Management costs would be lower in a permanent system than in the EBT demonstration because the system would become more familiar to operations staff and managers.

Finally, terminal and communications costs for an EBT system are highly sensitive to the transaction volume per terminal. Placement of terminals in relatively dense areas (such as a major city) can push down terminal costs, but the greatest savings require sharing equipment with other types of transactions. Establishing piggy-back relationships may be easier said than done, however: the slow spread of POS systems and congressional opposition to imposing food stamp-related costs on retailers could prove obstacles. On the other hand, technological change and market forces may also reduce terminal costs by making the equipment less expensive to buy and maintain.

3.4 CONCLUSIONS

The design, development, and implementation of the Reading EBT system cost approximately \$2.3 million. PRC, FNS, PDPW, and BCAO spent nearly 31 person-years on this effort. PRC's services for design, development and implementation cost \$1.9 million. The development phase (January through July 1984) was the most costly, at \$1.2 million for 16 person-years of effort.

The operating cost of the demonstration EBT system during its most normal period was \$27 per case month. The comparable cost for the ATP/coupon system was under \$3 per case month. The labor required for 24-hour EBT Center operations and the dedicated system of computers and terminals were the principal reasons for the great difference in cost.

The estimated ATP/coupon system cost for Berks County may be somewhat lower than ATP costs in general. PDPW has a very large computer center serving several assistance programs, keeping processing and reconciliation costs low. It has also recently increased the automation of its issuance functions, thereby cutting costs and reducing errors. State staff said in interviews that the cost difference in Pennsylvania may have been greater than it would be in a state with a less efficient coupon issuance system. On the other hand, such a state might require more resources to implement an EBT system.

The high observed EBT costs resulted in part from constraints of the demonstration. These include the short duration of the demonstration, which led to a decision to lease equipment rather than purchase it, and the need to have an independent contractor develop the system and then operate it in stand-alone fashion. Projections for a hypothetical state-operated system indicate that, without the demonstration constraints, costs of the Reading EBT system would amount to \$14 per case month. This is about half the previously observed cost, but still far above the ATP/coupon system's \$3 cost.

Analysis of EBT costs in other hypothetical scenarios shows considerable opportunity for further cost reduction. These analyses, summarized in Exhibit 3-12, yield monthly operating cost projections ranging from \$10 to \$2 per case month.

Two key factors produce these savings: scale economies in the central data processing operation, and efficiencies in the use of in-store terminals. Scale economies can be achieved by increasing the size of the food stamp caseload served and/or by placing the central EBT data processing functions on computers that are used for other purposes as well.

The high estimate of integrated state system costs assumes larger caseloads and shared computers, but no efficiencies in terminal use. EBT costs in this scenario fall under \$8 per case month with large caseloads. Integration of EBT data processing with other state applications can produce substantial savings, even for small-scale EBT systems. The extended demonstration offers the possibility of testing the integrated system scenarios, since PDPW is developing just such a system.

Terminal use may be made more efficient either by establishing the EBT system in areas with a high ratio of food stamp recipients to terminals, or by sharing terminals with commercial point-of-sale debit card systems. The estimates for the low-cost integrated state system assume high recipient/terminal ratios, while the "piggy-back" estimates assume that some or all terminals are shared. Estimates for the partial piggy-back system and the low-cost integrated state system are roughly comparable, ranging from \$4.60 to \$5.60 per case month for larger-scale systems.

Projected costs for the full piggy-back scenerio actually fall under ATP/coupon costs. This is not a realistic option in the near future, however, because many small retailers that participate in the Food Stamp Program are not expected to participate in commercial point-of-sale systems for at least the next few years.

The results of the simulation analyses are sensitive to a number of assumptions, including equipment purchase and service prices, terminal requirements, and PDPW processing costs. Nonetheless, it is clear that EBT system costs will be much higher with small caseloads than large ones, and also higher if the system stands by itself than if it is combined with a commercial system. It appears that favorable conditions will be required for any EBT system to save enough, relative to ATP/coupon costs, to pay back the substantial costs of development and implementation. However, it should be noted that even some development and implementation costs could be shared with applications of EBT technology to other assistance programs, such as AFDC and Medicaid.

The administrative cost of issuance is only one dimension of the EBT system's impacts on the Food Stamp Program. FNS sponsored the EBT demonstration because of the potential for improving program integrity, and because of potential benefits to system participants, including retailers, recipients, and financial institutions. These other dimensions of the impact of the EBT system on the Food Stamp Program are discussed in the following chapters. The benefits of the EBT system to Food Stamp Program integrity and to program participants must be weighed against any increase in administrative costs.

Chapter Four

VULNERABILITY TO LOSS AND ABUSE OF FOOD STAMP BENEFITS

Any payment system is vulnerable to "leakage" -- that is, to the accidental or intentional diversion of resources from their intended purposes. Food stamp issuance involves more complicated problems than the normal payment system, because the benefits are targeted not only to particular people (eligible recipients), but to a particular purpose (the purchase of authorized food items).

Like other forms of public assistance, the Food Stamp Program is often criticized for allowing too much fraud and abuse. Much of the criticism concerns problems related to certification rather than to the issuance system. These problems include erroneous eligibility determinations and benefit calculations and the fraudulent entry of cases onto the program rolls.

Nevertheless, some of the criticism and problems that are foremost in the public's awareness of the Food Stamp Program concern the mechanisms for issuing benefits and controlling their use. For example, the General Accounting Office has said that excessive losses result from the procedures for issuing Authorization-to-Participate documents¹. Shoppers talk about the teenager who buys a candy bar with a \$1 food stamp coupon and spends the change on video games. Stories abound of the black market for food stamp coupons, of people selling coupons for cash or using them to buy anything from paper products to pickup trucks.

This chapter addresses the question of whether an EBT system like that implemented in Reading is likely to reduce benefit loss and diversion below the levels that exist when ATPs and coupons are used to issue benefits.

Two aspects of this research question deserve attention here. First, the analysis does not compare actual losses during the demonstration

¹U.S. General Accounting Office, Millions Could Be Saved By Improving Integrity of the Food Stamp Program's Authorization-to-Participate System, Washington, D.C., January, 1982.

with analogous ATP/coupon losses. One reason is that the reporting systems that measure losses are limited, measuring only certain kinds of (discovered) losses. The ATP/coupon and EBT reporting systems are quite different, and do not produce directly comparable measures. More important, even perfectly measured losses in the Reading EBT demonstration would probably not represent losses in a mature, ongoing system. A fifteen-month demonstration is too short for people to learn all the ways to beat the system, and too small and too visible to be an attractive target for systematic crime. Accordingly, the analysis estimates the losses that would be expected of the EBT system in the longer term, and compares them with statewide or nationwide estimates of ATP/coupon loss.

Second, we take an inclusive view of program vulnerabilities: we examine those that actually add to the costs of the Food Stamp Program, and also those that divert benefits without adding costs. The distinction, we have found, is important. Vulnerabilities that add to program costs, like duplicate ATPs or counterfeit coupons, appear from the available data to be quite small. Although the EBT system seems able to reduce them, large savings cannot be expected. Vulnerabilities that divert benefits from their intended use, like coupon theft or the cash change that recipients get from coupon purchases, are reportedly considerable. The EBT system appears to have greater impact on these vulnerabilities.

RESEARCH STRATEGY

The research strategy focuses on five broad categories of vulnerability within which the ATP/coupon and EBT systems can be compared. Three categories lead to increased program costs:

- excessive authorizations -- food stamp benefits are authorized for people not found eligible by the certification process, or in amounts beyond those budgeted.
- excessive redemption credits -- food retailers or banks receive cash credits beyond the actual value of benefits they redeemed.
- loss and theft in production and handling -- benefits are redeemed without being authorized.

The other two categories do not add to program costs, but detract from the program's intended objectives:

- benefits lost by or stolen from recipients -- someone other than the recipient redeems the benefits, and the program does not replace the benefits.
- benefits used in an unintended manner -- recipients use benefits for purposes other than buying authorized food items, either in accord with program rules or in violation of them.

The analysis estimates the losses associated with each vulnerability category. Estimates for the current ATP/coupon system are based on data from Food Stamp Program reporting systems. Estimates do not reflect Reading alone, but the larger system of which Reading is a part. Thus, loss estimates pertaining to ATPs are based on statistics for the whole state of Pennsylvania (excluding Philadelphia and Allegheny counties, which use a different coupon delivery process). Estimates of losses from coupon production and redemption use nationwide statistics where possible, because these processes are not considered to vary materially from state to state and broader statistics provide a more accurate representation of the system as a whole. For vulnerabilities not represented in the reporting systems, we interviewed program officials to get information and judgments from which we could derive approximate loss measures.

For the EBT system, we estimate the losses that might be expected in a hypothetical "mature" EBT system, assuming its basic characteristics were similar to those tested in Reading (that is, the mature system is assumed to have the same configuration of hardware and no major change in security-related features like the PIN, but minor operational or software improvements are assumed to occur as needed). Numerous data sources were used, but the most important was a series of interviews with nine "expert respondents" -- individuals extensively familiar with vulnerabilities in the existing ATP/coupon issuance system, with security aspects of electronic funds transfer systems, or both.

Benefit losses and diversions are measured in terms of dollars per case month and as a percent of benefits issued. For comparability to national statistics, the dollar measure is adjusted to reflect the national average food stamp issuance level of \$122 per household per month in Fiscal Year 1985 (the Pennsylvania average was slightly lower, at \$111).

Because our methodology relies on judgments as well as quantitative measures, the resulting estimates must be viewed with some caution. The estimates are more meaningful than statistics taken directly from loss-reporting systems, however, because they adjust for gaps and inconsistencies in those systems. The methodology is particularly useful for showing the relative importance of various vulnerabilities and the different character of the EBT system's vulnerabilities from those of the ATP/coupon system.

HIGHLIGHTS

In general, an EBT system seems able to reduce food stamp benefit losses and diversions below the level currently experienced with the ATP/coupon system.

Benefit losses -- i.e., vulnerabilities adding to program costs -- are already relatively small in the ATP/coupon system. They amount to about 13 cents per case month, or about one tenth of one percent of program benefits. The EBT system could avoid two-thirds of these losses, mainly by eliminating losses in the coupon handling and production process.

Benefit diversions involve substantially more dollars than benefit losses. Diversions in the ATP/coupon system are estimated at \$3.97 per case month, or about 3.3 percent of benefits issued. Program rules allow recipients to get cash change up to 99 cents from a food stamp purchase, and they may spend the change on items other than food. This accounts for more than half of the estimated diversion in the ATP/coupon system, even though we assume that recipients spend about half of their cash change for eligible items. Largely because the EBT system gives no cash change, estimated EBT diversions are 70 percent less than those in the ATP/coupon system.

These results are presented in more detail below. Sections 4.1 through 4.5 discuss the five major vulnerability categories defined earlier. Each section assesses first the ATP/coupon system's vulnerabilities, and then those of the EBT system. Section 4.6 reviews the overall structure of vulnerabilities under the two systems.

4.1 EXCESSIVE AUTHORIZATIONS

Every month, the state or local food stamp agency must authorize a specific food stamp allotment for each participating household. In Pennsylvania, the Pennsylvania Department of Public Welfare (PDPW) is responsible for this authorization.

Once a month, PDPW runs a computer program that reads the master file of food stamp household records and then generates an issuance file with identifying information and an allotment amount for each household. In the ATP/coupon system, a second program produces ATPs, which are then mailed to Berks County recipients (some Pennsylvania counties use different delivery procedures). In the EBT system, PDPW generates a separate tape for EBT households and sends the issuance tape to the EBT Center, where EBT Center staff use it to post the benefits to the households' accounts.

EXCESSIVE ATP AUTHORIZATIONS

Excessive authorization occurs in the ATP/coupon system when the ATPs accepted for coupons exceed the amounts in the State's issuance file. Several kinds of problems can have this result, but the most common ones involve ATPs issued to replace those reported lost or stolen.

ATPs Lost or Stolen. Someone may steal an ATP from the mail or from a recipient. As a safeguard against this kind of loss, the ATP can be exchanged for coupons only if it is presented in conjunction with a valid identification card, which the recipient gets at certification. Nevertheless, a thief may obtain or fabricate an identification card, then take the ATP to an issuance office and exchange it for coupons.

If the recipient reports an ATP loss or theft to the local food stamp agency, the agency will issue a replacement ATP. When the recipient exchanges this ATP for coupons, and the thief also does, the Food Stamp Program incurs a loss. An official familiar with national data on ATP losses named this as the most common reason, accounting for nearly half of such losses.

Falsely Reported ATP Loss or Theft. Recipients may tell the local agency that their ATPs were lost or stolen, receive replacement ATPs, and exchange both for coupons. To guard against this possibility, recipients must

sign a register when they exchange ATPs for coupons. When the reconciliation procedure finds a duplicate issuance, the signatures are compared. If the signature comparison or other evidence indicates recipient fraud, action may be taken to recover the benefits and/or terminate the case. Falsely reported ATP loss and theft account for about a third of ATP losses, according to our respondent.

Generation of Multiple ATPs. Through either accident or fraud, two or more ATPs may be issued where only one was intended. If a recipient gets coupons for more than one ATP, action may be taken to recover the excess funds; the procedure is sufficiently difficult that funds are often not recovered, however. The multiple ATP problem is believed greatest in systems that issue some ATPs manually and some by computer. Interview respondents suggested that duplicates account for about 10 percent of mismatched ATPs nationwide, but probably less where all ATPs are computer-generated, as in Pennsylvania.

Other Problems. A variety of vulnerabilities account for the remaining unmatched ATP losses. Examples include ATPs that are altered to inflate their value, out-of-state ATPs, expired ATPs (ATPs must be exchanged for coupons in the month when they are issued), blank ATPs that are stolen and fraudulently filled out, and counterfeit ATPs.

Estimated Losses. FNS requires states to compare ATP redemptions to authorizations and to report the results monthly on a standard form (form FNS 46). In Pennsylvania, the local issuance offices send their lists of ATPs redeemed to the state agency. Data processing staff enter this information into a computer file, and compare it with the issuance file that generated the ATPs.

The reporting system provides data on the total value of "unmatched" ATPs, which we take as the measure of losses due to excessive authorization. Data were obtained for the state of Pennsylvania, excluding Philadelphia and Allegheny counties. These data indicate that excessive authorizations amount to about 0.04 percent of benefits issued in Fiscal Year 1985, or about 5 cents per case month.

Unmatched ATP figures probably understate the true rate of benefit loss for two reasons. First, a state's reconciliation reporting system may not actually capture all unmatched ATPs. One official familiar with these

systems felt that some states' reconciliation procedures were so weak that their reports might represent only half of the real losses, although the official was not specifically familiar with the Pennsylvania system. (Some counterbalancing problems occur, too, as when a recording error makes a legitimate ATP appear to be unmatched.) Second, not all authorization problems result in unmatched ATPs. For example, if someone in the state data center added fictitious cases to the issuance file, ATPs could be produced and redeemed without being "unmatched." The people we interviewed believed this kind of problem was rare, however.

Lacking any empirical basis for adjusting the loss rate for unmatched ATPs, the 0.04 percent figure is used here. This figure should be considered a lower bound, but it probably does not underestimate true losses by a wide margin.

EXCESSIVE AUTHORIZATIONS IN THE EBT SYSTEM

Excessive authorization can result in the EBT system either from an electronic credit or from a manually authorized purchase when the system is down. In either case, the recipient is authorized to use more benefits than the PDPW issuance file indicates.

Excessive Electronic Issuance. Only three actual instances of excessive authorization were discovered during the demonstration. Once a system error caused the issuance program to post an incorrect amount to one case. This problem was corrected before any loss occurred. In the second instance, a different system error caused six account records to be incorrectly updated with issuance data, and in the third, PDPW accidentally transmitted a set of authorizations twice, and both sets were posted to recipients' accounts. These latter two problems were not noticed immediately, and recipients spent some of the wrongly issued benefits before the accounts were adjusted.

In addition to authorization mistakes, like those above, excessive authorization could result from fraudulent activity. The major vulnerability to fraud appears to be the possibility that people operating the EBT system could establish fictitious cases. For example, a computer programmer working at the EBT Center might find a way to establish an unauthorized account and create an EBT card for that account. The programmer might then put in place a

procedure to generate issuances to this account as part of the regular authorization process. There are numerous variations on this general scheme.

The EBT system contains several safeguards against such threats. The first is separation of functions. PDPW must transmit an initial benefit authorization in order to establish an account. That account is not activated, however, until a worker at the BCAO carries out the procedure for encoding an EBT card. PDPW initiates subsequent issuances, as already described.

Other safeguards include three reconciliation procedures:

- issuance acknowledgment -- As the EBT Center receives each issuance transmission and posts benefits to recipients' accounts, it creates a tape of the authorizations received. The procedure is designed to allow PDPW to compare its transmission with the EBT Center's acknowledgment daily (the procedure was carried out less frequently in the demonstration, however). This documents that the issuances the EBT Center receives are the same ones PDPW sends.
- issuance reconciliation -- Transaction records of all authorizations posted to recipients' accounts at the EBT Center are accumulated and sent to PDPW once a month. PDPW compares the list of posted authorizations to its issuance file (at the same time it compares the list of redeemed ATPs to the issuance file). This procedure makes sure that the benefits actually posted to accounts are as PDPW intended.
- daily system balance -- A computer program checks each recipient and grocer account daily to make sure that the balance is equal to yesterday's total plus today's credits (benefit authorizations for recipients), minus today's debits (food purchases). If someone adjusts an account balance to add benefits to an account, the daily system balance should find a discrepancy.

In addition, physical access to the EBT Center is restricted and personnel receive security screenings. Software controls keyed to individual passwords limit the number of functions that any EBT Center employee can perform, but this control was found weak in the Reading system (multiple operators sometimes gained access to the system through a single password). The chief operator in the EBT Center not only had access to all normal functions, but could adjust accounts without creating a record of the adjustment in the EBT system files.

No instances of fraudulent authorizations, considered by the expert respondents to be the most serious of the vulnerabilities, were discovered during the demonstration. One respondent pointed out that the EBT reconciliation systems are useful for discovering and correcting accidental authorization problems, and that they should have a deterrent effect on fraud, but that they should not be expected to produce a meaningful measure of losses to fraudulent activity. A "serious" perpetrator might make losses invisible to the normal reconciliation, for example, by setting up special software controls causing the reconciliation system to overlook an illegitimate account.

Overdrafts in Manual Transactions. Because all electronic purchases are immediately debited, recipients cannot overdraw their accounts through normal purchase procedures. The manual authorization procedure, used when the main computers fail, does have some vulnerability. This vulnerability, however, would be expected to be very small.

To get authorization for a manual purchase when the main computer fails, the grocer calls the EBT Center. An EBT Center operator refers to the most recent printout of account balances (such a printout is produced every night). In any one day, a recipient can get manual authorizations for \$35 or the printed account balance, whichever is less. If the recipient has already made some electronic purchases since the last printout, the true balance will be less than the printed amount, and the recipient might be authorized for purchases exceeding the true balance. The maximum overdraft would be \$35; this could occur if the recipient's previous balance was more than \$35, and the recipient had exhausted the account during the day. If an overdraft occurs, the negative balance is carried forward and automatically applied to the next issuance. Thus the Food Stamp Program is vulnerable to loss only to the extent that the household receives no further issuances, or the issuances fall short of the negative balance.

Losses due to such overdrafts seem likely to be small, although that depends partly on how often the system fails. Over the course of the Reading demonstration, manual authorizations accounted for only about 0.3 percent of all purchases. At the time of the manual transaction, recipients' purchases since the previous midnight averaged \$3.78. Thus, if every manual transaction had been authorized for the full amount of the recipient's remaining balance,

overdrafts would have amounted to about 9 cents per case month.¹ Most recipients got further issuances after the manual transaction, however. Actual losses could have occurred only for those with no further issuances, and would amount to a maximum of 0.2 cents per case month.²

These calculations of maximum exposure do not take into account the \$35 maximum that existed in Reading, or the fact that many manual transactions are requested for less than the maximum possible amount. In the Reading demonstration, only 7 instances occurred in which a manual transaction led to an overdraft that was not followed by an issuance. This amounts to less than half of a percent of all manual transactions, or around a thousandth of a percent of all transactions. The associated benefit losses are too small to make a discernible contribution to our loss estimates.

Expected Losses. The expert respondents generally believed that the EBT system should encounter smaller losses from incorrect authorizations than the ATP/coupon system. By eliminating the intermediate authorization document (the ATP) and its transmission through the mails, the EBT system eliminates the vulnerability to theft by "casual" outsiders, and perhaps to recipient fraud. Most respondents felt that this was the most important distinction between the systems, and that other vulnerabilities are equivalent. For example, the vulnerability to system operators manipulating EBT authorizations differs little from vulnerability to the personnel who issue ATPs. Similarly, they generally expected redundant issuance problems to be about the same in the ATP and EBT systems. They did not expect losses from manual overdrafts to offset much of the gain from eliminating theft and reported theft of ATPs.

An EBT system's vulnerability to excessive authorization depends partly on whether recipients can claim losses and have their benefits replaced. In the Reading system, they cannot. Posting benefits to the recipient's account is considered equivalent to giving recipients their coupons: the Food Stamp Program does not replace coupons that recipients lose or have stolen, and it does not replace benefits lost from an EBT account.

¹Assuming 8 purchases per month, the calculation is $(8 \times 0.003 \times \$3.78) = \0.09 .

²Manual transactions not followed by an issuance amounted to 4 percent of the total, and recipients with no further issuances had average purchases of \$2.19 since the previous midnight. Thus the calculation is $(8 \times 0.003 \times 0.04 \times \$2.19) = \$0.002$.

One respondent argued persuasively that nondemonstration EBT systems might have different rules. He pointed to federal regulations concerning electronic funds transfers, which limit consumers' liability for erroneous or fraudulent debits to their accounts.¹ For the Reading system, the USDA Office of the General Counsel ruled that food stamp benefits are not "funds" of the type covered by the EFT regulations. Our respondent argued, however, that the regulations have established a general principle that consumers are held harmless from account losses, at least when they have not contributed to the loss overtly or through negligence. This principle would hold, for example, that recipients' benefits should be replaced if an EBT Center employee stole them from the accounts. Future EBT systems' rules may thus establish some vulnerability to recipient loss claims (perhaps including false claims), even though the Reading system has no such vulnerability.

Another respondent felt the electronic system might facilitate fraud by eligibility workers who set up fictitious cases. Because recipients must convert ATPs to coupons at the issuance office, a person converting multiple ATPs may be exposed at this point, a control not present in the EBT system.

the separation of functions between the eligibility worker, who makes the eligibility determination, the clerk who prepares the photo-ID card, and the clerk who initializes the card for EBT use. Thus the EBT system may tighten control at the point of case creation, while removing a control at the point of benefit receipt.

All but one of the expert respondents expected the EBT system to

ability to establish fictitious cases. Given these assumptions, estimated losses amount to 0.02 percent of benefits, or about 2 cents per case month.

This estimate may be considered in the perspective of national estimates of Automatic Teller Machine (ATM) fraud from a recent study.¹ The study found that losses in 1983 and 1984 amounted to about 0.02 percent of the value of all withdrawal transactions, roughly equal to the estimate for the EBT system.

4.2 EXCESSIVE REDEMPTION CREDITS

After accepting food stamp benefits as tender for recipients' purchases, grocers must redeem the benefits for cash. In the coupon system, grocers deposit coupons at their local banks, which credit the grocers' accounts. The local banks send the coupons on to Federal Reserve branch banks, which credit the local banks. In the EBT system, the EBT Center computer totals grocers' food stamp sales daily and writes the information onto a magnetic tape. The Center transfers the tape to a local bank, American Bank and Trust, which forwards the information to a Federal Reserve branch bank using the Federal Reserve's Automated Clearing House (ACH) system. Grocers' banks in Reading receive electronic transfers crediting the grocers' accounts the next day.

Both systems have controls to ensure that the credits given to grocers and banks do not exceed total benefits redeemed by recipients. Nonetheless, some vulnerability to excess redemption credits exists.

INFLATED CLAIMS IN COUPON REDEMPTION

To deposit coupons at their local banks, grocers fill out Redemption Certificates recording the deposit amount and store identification. Bank personnel are supposed to count the coupons and record the deposit amount on another part of the form. Nevertheless, a grocer might claim more than the actual deposit amount on a Redemption Certificate, and the bank might fail to count coupons and simply ratify the grocer's claim.

¹James M. Tien, Thomas F. Rich, and Michael F. Cahn, Electronic Fund Transfer Systems Fraud. Washington, DC: U.S. Dept. of Justice, Bureau of Justice Statistics. April 1986.

The local bank also has an opportunity to submit an inflated claim. The bank periodically assembles coupon deposits from all of its retailers for shipment to the Federal Reserve Bank. Coupons must be "strapped" in packs of 100, with only one denomination in each strap. The bank fills out a Food Coupon Deposit Document recording the total amount of the shipment, and attaches the relevant Redemption Certificates. On receipt of the shipment, the Federal Reserve Bank counts the \$5 and \$10 coupons, and counts a sample of the \$1 coupon straps. The Federal Reserve credits the local bank on the basis of the Deposit Document unless the count reveals a discrepancy. If a bank submitted a claim exceeding the actual coupon amount, and the Federal Reserve count missed the discrepancy, excess credits would be given.

Estimated Losses. No reporting system measures the losses due to accidentally or deliberately inflated claims by either grocers or banks. People familiar with the redemption system believed losses from these sources to be extremely rare. A Federal Reserve official indicated that discrepancies between Deposit Documents and coupon counts occur for about 1 in 5,000 coupons counted, (0.02 percent) with more of the discrepancies being coupon shortages than overages. Assuming that losses occur half as often as discrepancies are found, we estimate that losses amount to about 0.01 percent of benefits, or about one cent per case month.

EXCESSIVE ELECTRONIC CREDITS

The EBT system largely eliminates grocers' and their local banks' claims as elements in the food stamp redemption process. Instead, both have passive roles. The EBT Center initiates the redemption process, and the other active participants are American Bank and Trust and the Federal Reserve's Automated Clearing House system. The Food Stamp Program's vulnerability to granting excessive credits thus lies mainly with these organizations.

No instances of excessive credits were known to have caused actual losses during the demonstration. Two general kinds of vulnerability were identified, however: manipulation of grocer accounts at the EBT Center, and intervention in the funds transfer process.

Manipulation of Grocer Accounts at the EBT Center. The EBT Center maintains a computer account for each participating grocer. When a recipient

makes a purchase, a credit is posted to the grocer's account. At the end of the banking day, a "bundle-up" program totals all credits posted to the grocer during the day.

An action creating erroneous credit postings might lead to excessive credits. For example, a system error might lead to a duplicate credit or to an erroneously large credit. (This occurred at least once during the demonstration: a retailer received a credit of \$600 as a result of a system problem that was never fully identified.) A person with access to the EBT Center might cause false transactions to be posted to a real or false account. The daily system balance reconciliation, which assures that total credits to grocers equal total debits to recipients and that each grocer's balance equals yesterday's balance plus today's sales (adjusted for refunds) minus today's redemptions, is the main safeguard against such events. The procedure for establishing a grocer account in the ACH system, which involves a waiting period and a check on the legitimacy of the account, provides additional protection against false accounts.

Intervention in the Funds Transfer Process. After totaling grocer credits, the EBT Center records the totals due to all grocers on a magnetic tape. EBT Center staff physically transfer the tape to AB&T staff located in the same building. AB&T strips out information related to AB&T accounts for direct crediting, adds the information on other banks' accounts to its daily funds transfer tape, and electronically transmits the data to the Philadelphia Federal Reserve bank for processing through the ACH. AB&T then requests a transfer from a special letter-of-credit account established for the demonstration. The request covers AB&T's credits to its own grocers' accounts and its transfers to accounts in other banks.

Excessive credits occur if the letter-of-credit request exceeds total legitimate credits to grocers. For example, additional items might be added to the funds transfer tape at the EBT Center, at AB&T, or in the transfer of the tape, though no such incidents were revealed during the demonstration. Alternatively, AB&T might inflate the letter-of-credit request. On at least one occasion, AB&T made an error in a letter-of-credit request on one day, realized the error, and to compensate made an unauthorized adjustment to the next day's request. No loss occurred, but the incident illustrates the potential vulnerability.

Reconciliation systems supplemented by physical security and personnel screening provide the main protection against these vulnerabilities. Reconciliation includes an "acknowledgment tape" that AB&T prepares to allow the EBT Center to compare the data it sends with the data AB&T receives. In addition, FNS staff compare the total values of credits, transfers and the letter-of-credit request.

The expert respondents felt that excessive credits resulting from these EBT vulnerabilities should be smaller than losses in the paper system, because of fewer people participating in the system, fewer opportunities for human error, and the control possible with daily reconciliation. The respondents' estimated reductions in losses ranged from 33 percent to 75 percent of the level estimated for the paper system, with a mean of 52 percent.

Lacking any basis for decomposing the respondents' arguments into component estimates, we accept the overall average and estimate a 50 percent reduction in losses. This would imply losses of about 0.005 percent of benefits, or about half a cent per case month. It should be noted that these losses could be different in character as well as amount from losses in the coupon system. While coupon losses presumably stem from a large number of small-value incidents, the EBT system has the potential for occasional very large losses.

The loss estimate cannot easily be compared to any external benchmark. EBT redemption is comparable to a wire transfer process. The study referenced earlier concerning ATM fraud also examines wire transfer fraud, but does not provide general statistics on the frequency and value of losses. It indicates that errors (typically transcription errors) occur in 0.2 to 0.5 percent of all wire transfers, and that the vast majority of these errors are exposed and corrected without loss. The study further indicates that fraud most commonly occurs as a result of an error -- for example, when an individual or institution receives an erroneous "windfall" deposit and does not return it. These findings are consistent with the EBT experience and, in general terms, with the loss estimate. The value of such reconciliation systems -- especially their value as a deterrent -- depends on their timeliness. Reconciliation information was not always timely in the Reading system, sometimes lagging by weeks, but a mature system would be expected to produce such information daily.

4.3 LOSSES IN PRODUCTION AND HANDLING

The coupon system depends on the paper coupon as a physical representation of Food Stamp Program benefits. Coupons must be printed, and must be shipped, stored, and handled many times before they are ultimately destroyed. This process creates opportunities for theft and error that have no direct analogy in the EBT system.

COUPON LOSSES

The coupon production and handling process is subject to loss at a variety of points, but the losses are not measured in a general reporting system. Using a combination of reported data and interpretive estimates, we estimate total production/handling losses at 0.06 percent of total benefits, or 7 cents per case month. The components of this estimate follow.

Theft During Production, Shipment, and Storage. FNS contracts with two companies (American Bank Note and U.S. Bank Note) to print food coupons. Coupons are transported, sometimes to intermediate storage locations and sometimes direct to issuance locations, under a variety of contracts for secure shipping.

Thefts have been rare, but sometimes substantial. In December 1983, thieves took nearly \$5 million in coupons from one of the printing companies (much but not all was subsequently recovered). Smaller losses are more common, but are not measured in any existing reporting systems. Because production and shipping contracts make the contractor liable for losses, the actual cost of these losses is the contractor's insurance cost, which is typically part of the indirect cost of the service.

Based on interview information about the frequency and magnitude of thefts, we estimate this category of losses at 0.008 percent of benefits, or one cent per case month.

Losses From Issuance Offices. Issuance offices (in Reading, local bank branches) accept ATPs from recipients and issue food stamp coupons in return. The banks maintain a coupon inventory sufficient for several months, storing the coupons in vaults using security precautions equivalent to those for cash. Officials familiar with issuance office operations indicated that

most losses stem from bank personnel accidentally giving recipients more coupons than the amount of the ATP. Employee theft and collusion with recipients were the other major sources of loss identified.

A reconciliation system exists to measure inventory loss from issuance offices (using form FNS 250). Data from this system indicate statewide losses for Fiscal Year 1985 of about 0.05 percent of benefits, or 6 cents per case month.

Counterfeit Coupons. Food stamp coupons, like currency and other documents with significant redemption value, are designed to make counterfeiting difficult. Nonetheless, interviews indicated that about \$250,000 in counterfeits are discovered annually, and that perhaps an equal amount is undiscovered. This amounts to 0.002 percent of all benefits, or about one-quarter cent per case month.

Recycled Coupons. As coupons are redeemed, the grocer endorses them and the grocer's bank cancels them. One purpose of the cancellation is to keep the coupons from being used again. Although recycling can still occur, all respondents considered it extremely rare -- substantially less common than any of the other kinds of losses. We therefore estimate that losses amount to 0.001 percent of all benefits, or less than one-tenth of a cent per case month.

EBT Losses

None of the expert respondents could think of any vulnerabilities of an EBT system equivalent to coupon losses during production and handling (apart from vulnerabilities discussed in other sections). Accordingly, we estimate zero EBT losses in this category.

4.4 BENEFITS LOST BY OR STOLEN FROM RECIPIENTS

Once recipients exchange their ATP cards for coupons, they are responsible for keeping the coupons secure until they use them. If recipients lose their coupons or if someone steals them, the Food Stamp Program does not replace them. Coupon loss or theft, therefore, does not cause additional government expenditures. It does mean that the benefits are not serving their intended purpose, however.

In the demonstration EBT system, recipients are considered to have possession of the benefits when they have been placed in the recipients' accounts (i.e., when authorization is complete). As with stolen coupons, stolen electronic benefits are not replaced; they detract from the program's intent, but do not increase its costs.

LOST AND STOLEN COUPON BENEFITS

Recipients may lose the value of their coupon benefits in two ways. First, the coupons themselves may be lost, stolen, or destroyed. Second, grocers may take advantage of recipients by overcharging -- in effect, discounting the value of the coupons.

Although no monitoring system exists to measure such losses, surveys conducted as part of the evaluation asked recipients about various types of loss and theft (see Chapter 6 for description of the surveys). Estimates of coupon loss and theft are based on responses from food stamp recipients living in Berks County just outside the demonstration area. The surveys were conducted in the spring and fall of 1985; results are averaged in the estimates below.

Coupon Theft and Loss. Food stamp recipients reported an average of about one instance of coupon loss or theft for every eight households in a year, with an average value of about \$64 in benefits. Losses are thus estimated at 66 cents per case month.

Overcharging. The survey asked recipients about losses due to being charged too much for purchases, with no distinction between accidental and intentional overcharging. Reported incidents occurred for about one in four households in a year, with an average value of just over \$6 per incident. Estimated losses are 13 cents per case month.

Estimated Diversions. Recipients' estimates of their total losses from coupon theft or loss and from overcharging are thus estimated at 79 cents per case month, or about 0.65 percent of benefits issued. It is important to treat this estimate with some caution. It is likely to be biased upward, because people reporting on the frequency of rare events, especially problem events, often overestimate them. This contrasts with the estimates from official reporting systems, which more often understate problem frequency because they capture only certain kinds of events.

LOSS AND THEFT OF ELECTRONIC BENEFITS

Vulnerabilities in the EBT system differ substantially from coupon vulnerabilities. Because benefits are held on computers rather than in physical possession, recipients cannot misplace or accidentally destroy benefits. Someone, however, may gain access to the recipient's account and remove benefits. Furthermore, as in the coupon system, retailers may accidentally or intentionally overcharge recipients for food purchases.

Electronic Losses. Several kinds of electronic theft could remove benefits from recipients' accounts. For example:

- an EBT Center employee might divert issuances from the intended recipient's account to another (possibly fictitious) account;
- a thief might steal a recipient's EBT card and use it to make purchases;
- an employee of the local food stamp agency might prepare a second EBT card with access to a recipient's account, and use it to make purchases; and
- a computer "hacker" might establish a connection to the EBT Center, transmit a message that appears to represent a legitimate purchase at a grocery store, and cause the recipient's account to be debited.

The EBT system contains numerous controls intended to prevent these and related forms of theft, as well as accidental computer actions having similar results. The safeguards include the daily system reconciliation and issuance reconciliation procedures described earlier. Another protection is the Personal Identification Number (PIN), required to gain access to a recipient's account with an EBT card. The system includes provisions to prevent someone who has obtained a recipient's card from learning the PIN by trial and error. Transmissions from grocery stores to the EBT Center include authentication codes to be sure they come from legitimate terminals.

Recipients generally felt less vulnerable to losing EBT benefits than coupon benefits. Among people who had participated in both systems (those receiving food stamp benefits before the demonstration began), about three-quarters felt that benefits were lost and stolen more often in the coupon than the EBT system.

The surveys asked recipients in the EBT system about losses they experienced, including incorrectly low benefits being put in their account, benefits taken from the account, and losses resulting from lost and stolen cards. Combining all types of incidents, recipients' reported losses amounted to about 19 cents per case month. (Chapter 6 presents data on the frequency and value of the various kinds of incidents.)

The largest single contribution to this loss estimate came from recipients reporting in the first survey that an incorrectly small amount of benefits was placed in their account. Reported losses from erroneous issuance declined drastically in the second survey. This suggests either that some of the early problems were actually recipient misunderstandings, that recipients learned over time how to get issuance errors remedied, or that the problems stemmed from system difficulties that were subsequently corrected. Adjusting the overall loss figure to reflect the level of issuance loss reported in the second survey only, reported losses would amount to about 7 cents per case month.

The expert respondents generally agreed that lost and stolen benefits should be less in the EBT than the coupon system. They felt that system controls could hold "insider" manipulation to an extremely low level. Such controls would include strict limitation of the functions that any particular operator could access, automatic reporting of software modifications and internally-initiated account adjustments, automated monitoring of "suspicious" activity patterns (e.g., debits to accounts that have been inactive for a prolonged period), and routine financial reconciliation. (Some respondents familiar with the Reading system said their estimates assumed tighter access controls and monitoring than the demonstration system actually had.) Most respondents also felt that the EBT system offered too little payoff to be an attractive target for outsider manipulation of accounts.

Overcharging. Recipients reported overcharging by grocers in the EBT system amounting to about 6 cents per case month. Although this is somewhat less than half the losses reported by households using coupons, the difference is not statistically significant.

The expert respondents generally saw no difference between the coupon and EBT systems. One respondent, however, argued that electronic overcharging might happen more frequently: recipients might be less aware of

the total on their EBT receipt than to the total amount of coupons they hand over, because the receipt demands less immediate attention.

Estimated Diversions. Our estimate of EBT benefit losses to recipients is 24 cents per case month, or about 0.2 percent of benefits. This assumes that losses from retailer overcharging occur at the same level in the EBT as the coupon system, and uses recipient survey estimates of losses from other sources (averaging the two survey waves). This figure is about one-third of the recipients' reported loss level with coupons, slightly lower than the overall estimates of the expert respondents. They suggested that EBT losses would be lower than coupon losses, but estimated an average reduction of 56 percent.

4.5 RECIPIENTS' USE OF BENEFITS IN UNINTENDED MANNER

Recipients are supposed to use food stamp benefits only to purchase authorized food items. Through inadvertence or intent, however, some benefits are used for other purposes. As with benefit theft, the unintended use of benefits does not increase program costs, but detracts from the achievement of program objectives.

UNINTENDED USE OF COUPONS

Purchasing Unauthorized Items. Almost all grocery stores sell many items that cannot legitimately be purchased with food stamp benefits (e.g., soap, paper products). Nevertheless, retailers sometimes accept coupons for such items. This can happen through ignorance of the regulations, through carelessness in ringing up the purchase, or through the retailer overlooking the regulations.

Because no existing reporting systems measure the frequency or value of unauthorized item purchases, we interviewed people familiar with the store investigations that are carried out to enforce program rules. They said that recipients rarely buy unauthorized items in the larger stores and supermarkets, which account for about three-quarters of all coupon redemptions. Supermarkets typically have extensive training for cashiers, and many have scanner systems that automatically determine whether items are eligible for food stamp purchases. Problems occur more frequently in other kinds of stores, but still involve only a part of the transaction in a small percentage of purchases.

Based on this information, plus information from an FNS study concerning stores' propensity to make unauthorized sales, we estimate that unauthorized items are purchased with 0.17 percent of all food stamp coupons, or about 21 cents per case month.¹

Trafficking. Recipients can also sell coupons for cash, a practice commonly known as "trafficking". Sometimes recipients sell coupons directly to grocers. Other times the recipient sells coupons to a third party, who may use them to buy food or may sell them to a grocer for cash. In either case, participation of an authorized retailer is necessary in order to redeem the coupons.

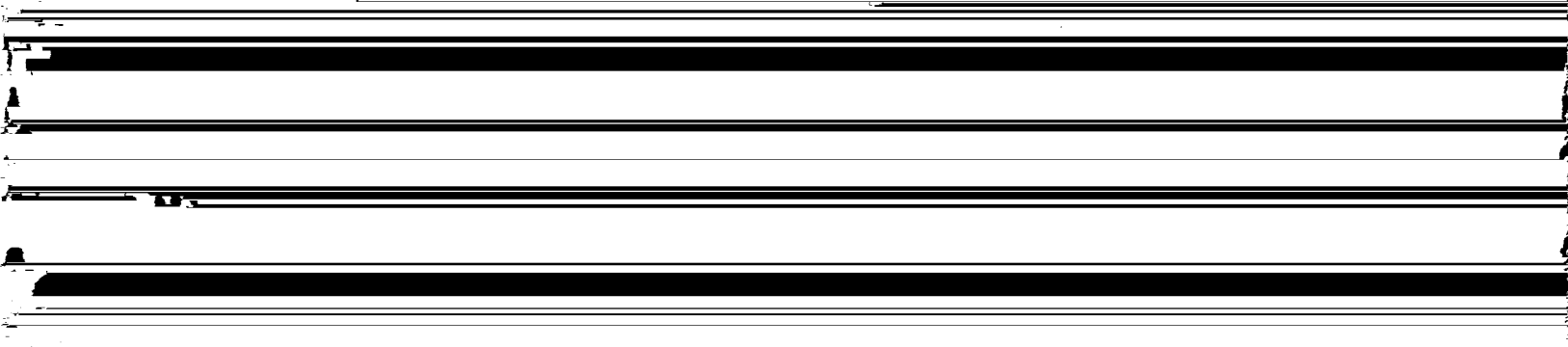
Trafficking, like unauthorized purchases, is not measured by any routine reporting system. Interviews indicated, however, that about one-eighth of all stores disqualified from participation in the Food Stamp Program are caught trafficking. This information was combined with data from the study referenced above to estimate total trafficking volume. We assumed that one-eighth of the three-buy stores identified in the random sampling were also trafficking in coupons. Based on respondents' statements that trafficking accounts for a substantial proportion of redemptions in those stores that traffic, we assumed that a third of these stores' total food stamp redemptions resulted from trafficking.

¹"Food Stamp Program Redemption System: A Preliminary Assessment." Alexandria, Virginia: FNS, Program Accountability Division, June 21, 1984. Investigators attempted to purchase unauthorized items in a random sample of stores. In 14 percent of the large stores (total monthly sales over \$100,000), investigators were able to make an unauthorized purchase; they made three such purchases (enough to disqualify the stores from participating in the program) in 4 percent of the stores. At least one unauthorized purchase was made in 50 percent of the smaller stores; the three-buy rate was 29 percent. In estimating total unauthorized purchases, we assumed that recipients might attempt to buy unauthorized items in 10 percent of their purchases, and that the unauthorized items in these cases would amount to 10 percent of the total value of the intended purchase. We assumed that all attempts to purchase unauthorized items would be accepted in the three-buy stores, half the attempts would be accepted in the one-buy stores, and none would be accepted elsewhere.

These assumptions yield an estimate that coupon trafficking accounts for 0.39 percent of all food stamp coupons redeemed, or about 48 cents per case month.

Cash Change From Coupon Purchases. The smallest denomination of food stamp coupons is \$1. If a recipient's food stamp purchase does not come out to an even dollar amount, the retailer gives change (up to 99 cents) in U.S. currency. Recipients are free to spend the change as they wish, but they are not allowed to make repeated small purchases to generate change.

The availability of cash change represents a pragmatic conclusion that any alternative policy would be more costly and cumbersome than worthwhile. If it were possible to restrict the entire value of recipients' ~~benefits to authorized food items~~ the legislation would almost certainly do



so. (In fact, paper change was used for this purpose in the early days of the program.) Thus, it is reasonable to view change spent on unauthorized items as an unintended use of benefits, comparable in some respects to purchases of unauthorized items with coupons.

Data from the EBT system indicate that food stamp purchases average \$13.65 in value. Assuming that the average purchase with coupons is about the same, and that the change given averages fifty cents,¹ then about 3.7 percent of program benefits are given in change.

Recipients presumably spend some of this change on authorized food items at a later date. We assume recipients follow general patterns for the food stamp population, which spends an estimated 45 percent of total income on food.² We thus estimate that change received for coupon purchases and spent on unauthorized items amounts to 2.04 percent of all benefits, or \$2.49 per case month.

¹We assume that the amount of change is uniformly distributed between 0 and 99 cents. Note that the average purchase value of \$13.65 does not imply an average of 35 cents in change. To illustrate: the average value of one \$1 purchase and two \$2 purchases is \$1.67, but the average value of the change given in these purchases is zero.

Estimated Diversions. The combined value of purchases of unauthorized items, trafficking, and change spent on unauthorized items is estimated at 2.6 percent of total program benefits, or \$3.18 per case month.

UNINTENDED USE OF EBT BENEFITS

All of the unintended uses of food stamp coupons described above depend on two factors: a recipient's desire to use the benefits for something other than purchasing authorized items, and the availability of a mechanism for doing so. Although the EBT system presumably has no effect on desires, it does change some of the mechanisms for using benefits.

Purchasing Unauthorized Items. The EBT system contains no controls on the purchase of unauthorized items not already present in the coupon system. The main controls are the investigation procedures used to enforce store compliance with the regulations, and automatic identification of eligible items in scanner-based cashiering systems.

Although some grocers indicated in survey responses that they thought the EBT system reduced the frequency of unauthorized purchases, the expert respondents disagreed. All expected the value of unauthorized items purchased in the EBT system to be equal to that in the coupon system. Some felt that a "computer mystique" might initially deter such purchases, but that any such effect would be short-lived. FNS investigators found several stores to be selling unauthorized items for EBT benefits.¹

Trafficking. Recipients desiring to sell their benefits to grocers can do so as readily as in the coupon system: the retailer executes a normal purchase transaction, and then gives the recipient an agreed amount of cash. The EBT system does make it more difficult for a recipient to sell benefits through a third party, however. The recipient must either give up use of the EBT card permanently or trust the buyer to return the card after withdrawing an agreed amount of benefits.

¹No investigations were conducted during the original demonstration, but seven stores were investigated early in 1986, during the extended demonstration. Investigators attempted to use EBT cards to purchase unauthorized items. The investigation resulted in six-month disqualification for three stores, and warnings to two others.

Recipients and grocers felt that the EBT system substantially reduced trafficking. Retailers were asked whether particular kinds of benefit abuses occurred more often with coupons or the EBT system. Overall, 82 percent felt that fraud and abuse were more common in the coupon system, and the remainder either felt the systems were the same or had no opinion. Asked specifically about recipients selling their benefits for cash (to someone other than grocery personnel), 90 percent said the problem was more prevalent with coupons. Similarly, 75 percent of the recipients in the final survey agreed with the statement, "people who want to sell their benefits for cash cannot do it with cards as easily as with coupons."

The expert respondents were divided. One group expected the difficulty of selling benefits through an intermediary to reduce trafficking, probably by about half. The other group felt that no effect would occur, arguing that the system would not change either the recipient's desire to sell benefits or the grocer's willingness to accept them, and that the intermediary merely facilitates the connection between those two points.

Change for Food Stamp Purchases. Recipients get no change from EBT purchases, because the exact amount of each purchase is debited to their account.

The expert respondents pointed out, however, that the EBT system would not necessarily eliminate this type of unintended benefit use. If recipients want to convert their benefits to cash, and use small purchases as a means of doing so in the coupon system, they may resort to other mechanisms under the EBT system. Anecdotes from the demonstration support this view. Some grocers reported, for example, that some recipients purchased food with their EBT card and then sold the food for cash.

Estimated Diversions. Our estimate, based mainly on the expert respondents' opinions, is that about 0.73 percent of benefits would be used for unintended purposes in the EBT system. This amounts to about 89 cents per case month. The estimate assumes no change from the coupon system in the value of unauthorized items purchased, a 10 percent reduction in trafficking, and a 90 percent reduction in change spent for unauthorized items.

4.6 CONCLUSIONS

It appears that an EBT system such as that implemented in Reading would substantially reduce the Food Stamp Program's vulnerability to loss, fraud, and abuse of benefits. This conclusion must be treated cautiously, as it is based mainly on opinions about what would be expected of an EBT system rather than actual measures of losses in Reading. Nonetheless, the various sources of information are quite consistent in suggesting that losses and diversions would be reduced.

Taking all vulnerabilities together, we estimate more than a two-thirds reduction in the value of program benefits subject to loss or diversion, from over 3 percent of benefits in the ATP/coupon system to less than 1 percent in the EBT system. These estimates are summarized in Exhibit 4-1.

Only a small part of the total estimated vulnerability actually represents increased costs to the taxpayer, however. The available data indicate that the ATP/coupon system loses about one tenth of one percent of total benefits to fraud and error, or 13 cents per case month. The EBT system is estimated to reduce these losses substantially, mainly by eliminating losses in coupon production and handling. Even if the EBT system eliminated all losses, however, the savings in total program expenditures would be small.

The biggest vulnerabilities, in terms of dollar value, result in benefits not being used to help recipients buy food. Surprisingly, the single largest vulnerability -- and the largest effect of the EBT system -- concerns the use of cash change to purchase unauthorized items.

Cash change is neither fraud nor error, because program rules allow grocers to give retailers up to 99 cents in cash change from a food stamp purchase. Nevertheless, it is clear that the general intent of food stamp legislation is to restrict benefit use to the purchase of authorized items; the cash change policy is simply a pragmatic relaxation of the general rule. The EBT system, by deducting exact amounts from recipient accounts, redirects about 1.8 percent of program benefits from other uses to the purchase of authorized items.

The next largest impact projected for the EBT system comes from reducing the rate at which recipients' benefits are stolen or lost. If such

Exhibit 4-1

Summary of Vulnerability Estimates

	<u>ATP/Coupon System</u>		<u>EBT System</u>	
	<u>% of</u>	<u>\$ Per</u>	<u>% of</u>	<u>\$ Per</u>
	<u>Benefits</u>	<u>Case</u>	<u>Benefits</u>	<u>Case</u>
		<u>Month</u>		<u>Month</u>
<u>Vulnerabilities adding to program costs</u>				
Excessive authorizations	0.04%	\$0.05	0.02%	\$0.02
Excessive redemption credits	0.01	0.01	<0.01	<0.01
Losses in production and handling	0.06	0.07	0.00	0.00
Subtotal--Losses	0.11	\$0.13	0.03	\$0.03
<u>Vulnerabilities detracting from achievement of program goals</u>				
Benefits lost by or stolen from recipients	0.65	0.79	0.20	0.24
Benefits used in unintended manner	2.60	3.18	0.73	0.89
Subtotal--Diversions	3.25	\$3.97	0.93	\$1.13
All vulnerabilities^a	3.36	\$4.10	0.96	\$1.16

^aTotal benefit losses do not exactly equal the sum of the component estimates due to rounding.

losses are reduced as much as the Reading recipients indicate, about another 0.4 percent of benefits will be available for recipients' food purchases.

Even if the EBT system's impact on taxpayer costs is small, the analysis suggests it affects public perceptions of program vulnerability. Recipients' use of cash change for purchases other than food is highly visible to the public -- i.e., to grocers and to other customers standing in line. Moreover, both grocers and recipients, in responding to survey questions, said they felt the EBT system greatly reduced various forms of fraud and abuse. Although our expert respondents were more skeptical, the grocer and recipient responses may be the better gauge of general public perceptions.

Chapter Five

EFFECTS OF THE EBT SYSTEM ON GROCERS

When the concept of an Electronic Benefits Transfer system for the Food Stamp Program was initially debated, representatives of the retail food industry voiced a number of concerns. The Food Marketing Institute, the major trade association for the nation's supermarkets, wrote a letter to the Food and Nutrition Service identifying three areas of potential harm to retailers¹:

- Productivity at the checkout counter, which could be reduced by computer failure, customer disagreements with computer-generated information, and space consumed by equipment;
- Costs, particularly for equipment and training; and
- Impact on independent operators, which might be disproportionately heavy because of their smaller financial base and which might cause them to stop participating in the Food Stamp Program.

Despite these concerns, the industry did not oppose the idea of an EBT system, because it also offered some potential advantages. Compared to the coupon issuance system, an EBT system might reduce grocers' handling costs by eliminating the counting, sorting, and validating of food stamp coupons. The float loss on coupons held longer than one day could be reduced or eliminated. An EBT system also offered the potential for greater accuracy and security, as opposed to the existing system, in which coupons could be miscounted, lost, or stolen.

The EBT issues mirrored broader questions of applying debit card point-of-sale (POS) systems in the retail food industry. The industry has been slow to accept such systems, largely because it has been unclear how POS would affect checkout times and how much the retailers would have to pay.

¹Letter from Harry Sullivan, Senior Vice President and General Counsel of FMI, October 18, 1982.

As the EBT demonstration was planned, retailer participation became a focal point. If grocers were too worried about the EBT system, they might refuse to participate. If they participated and found the system too burdensome, they might drop out. Because the Food Stamp Program depends on retailers accepting food stamp benefits as payment for food, a low participation rate could cause the demonstration to fail and cast a cloud on future applications of electronic systems in the Food Stamp Program.

RESEARCH STRATEGY

This chapter addresses two groups of questions, one concerned with retailers' opinions about the EBT system and the other with the costs retailers incur to participate in the Food Stamp Program:

- How do retailers respond to the EBT system?

Do they prefer EBT to the coupon system?

What do they like about the EBT system, and what problems do they see?

Would they be willing to bear some of the costs of an EBT system?

- What are retailers' food stamp participation costs in the ATP/coupon system and the EBT system, where participation costs include:

longer checkout time for food stamp purchases than cash transactions;

handling, depositing, and reconciliation of food stamp benefits;

training employees in food stamp procedures;

float -- that is, interest foregone because of a delay between a food stamp purchase and the availability of funds to the retailer;

losses due to accounting errors;

reshelving items returned or brought to the checkout counter but not purchased; and

space consumed by the EBT terminal.

Data on retailers' responses come from a series of six interviews with store owners and managers (see Appendix V-A, pp. V-5-7). These interviews, four conducted in-store and two by telephone, took place at regular intervals between June 1984 and December 1985. Interviewers asked store personnel to state their opinions about the EBT system and to compare the EBT system with the coupon system, where appropriate.

The surveys are also the main source of information on retailer participation costs (except checkout cost, which is discussed below). Interviewers asked the retailers to provide data about the various participation costs or to estimate costs if hard data were unavailable. Estimates of ATP/coupon costs are generally based on the Pre-Demonstration interview, which was conducted in July-September 1984, just before the EBT system was implemented. Most estimates of EBT costs come from the Late Demonstration interview conducted just over a year later in October-December 1985.

Checkout costs were measured in a series of three observation studies, carried out in the Pre-Demonstration, Early Demonstration (January-March 1985), and Late Demonstration periods. Observers with stopwatches recorded the duration and characteristics of food stamp and regular purchases in a sub-sample of 29 participating stores, and also in 10 comparison stores in nearby Allentown, Pennsylvania. Regression analysis is used to estimate the incremental time for EBT and coupon transactions over that for cash purchases.

Retailer participation costs are presented in terms of the cost per \$1000 of food stamp benefits redeemed. Cost per store per month is also presented, to provide a perspective on the level of cost incurred by the average store. Cost per case month, the main measure used in other chapters, is not a natural measure of retailer activity, because recipients do not necessarily spend their whole monthly allotment in a single store.

HIGHLIGHTS

Retailer refusal to participate, the central concern before the demonstration, was not an issue. By mid-1984, well before the EBT system began operating, nearly all of the retailers in the test area had agreed to participate, and others outside the test area had expressed interest. Participation remained high throughout the demonstration. In fact, by the

scheduled end of the demonstration in December 1985, retailers had become the most active proponents of the system and had enlisted the support of their trade organizations in lobbying for its extension.

Retailers' opinions, recorded in surveys, strongly favor the EBT system. At least 60 percent of the respondents to each survey preferred the EBT system, while less than 25 percent preferred coupons. Reduced handling costs and reduced fraud and abuse are the most common reasons for preferring EBT. Complaints focus most strongly on the deposit reconciliation system, although a number of other specific problems are cited.

Retailers' food stamp participation costs are, on average, lower in the EBT system than with coupons. Estimated costs are \$13 per \$1000 of benefits redeemed in the EBT system, compared to \$18 with coupons. Reductions in handling cost account for most of the EBT advantage. Checkout times are slightly longer with EBT than coupons.

It is important to view these findings in the perspective of the substantial efforts made in the demonstration to anticipate and allay retailers' concerns. PRC worked hard to obtain grocers' opinions and respond to them. FNS paid for all aspects of the system, including the terminals in the stores, so grocers had no direct expenditures for the system. Retailers indicated in survey responses that they would be much less receptive to a system involving fees or other direct expenditures.

5.1 GROCER'S OPINIONS ABOUT THE EBT SYSTEM

Doubtless the most important indication of retailers' response to the EBT system was their behavior: practically all who were eligible participated in the demonstration, and they worked actively to extend system operations past the scheduled end of the demonstration. Surveys conducted throughout the demonstration confirm the grocers' positive response, and indicate some of the specific benefits they found. Nevertheless, the survey responses also reveal some system characteristics that retailers considered undesirable, and aspects they would like to see improved.

INITIAL EXPECTATIONS

The first indication that retailers would respond warmly to the EBT system came in the spring and summer of 1984, when PRC canvassed the stores to see which ones would participate. Of the 169 grocers authorized to accept food stamps in the test area (a five-mile radius around Reading), 124 initially chose to participate in the EBT demonstration. A number of others joined later. The stores that declined participation were mostly small stores located well outside the central Reading area from which the EBT recipients were drawn. The high participation rate does not necessarily mean unanimous support for EBT: stores that did not participate stood to lose the food stamp business of any customers living in the demonstration area. Nonetheless, survey responses indicate that retailers had generally positive expectations.

Asked what they saw as the potential benefits of EBT, 54 percent of grocers said they thought that an EBT system would save handling and other "back end" time (the most frequent response). The second most common response (42 percent) was that EBT would reduce fraud. This was usually a general statement, with no specific type of fraud mentioned, though some responses specifically concerned trafficking. A related response, from 24 percent of retailers, concerned the fact that because EBT sales are transacted for the exact purchase amount, there is no requirement to give cash change.

The retailers' emphasis on the EBT system's ability to control fraud and abuse is somewhat surprising. Responses more clearly related to operating convenience and store profitability were expected. Giving change for food stamp purchases does have some business aspects: handling change is time-consuming, and if food stamp recipients do not get change they may spend more of their benefits in the grocery store. Nevertheless, the interviewers report the grocers' primary concern to be whether benefits are used for their intended purposes. Surprising though the theme was, it was repeated in subsequent interviews throughout the demonstration.

When asked about the potential drawbacks of the system, retailers gave fewer responses and focused more clearly on business issues. The most frequent response in this category (23 percent) was that recipients would have problems coping with the system, not understanding it, forgetting their PIN,

or losing track of their balance. The second most frequent answer was that system response time would be slow (18 percent).

OPINIONS AFTER EXPERIENCE WITH THE SYSTEM

After startup in October 1984, it quickly became clear that retailers in the test area wanted to remain a part of the EBT system. The rate of participation among retailers stayed high, and nearly all newly authorized stores requested admission to the demonstration. In order to determine whether retailers actually preferred the EBT system to coupons or whether they simply did not wish to relinquish their food stamp business, interviewers periodically asked retailers which system they preferred.

The surveys show a strong and consistent preference for the EBT system. As Exhibit 5-1 indicates, at least 60 percent of the retailers in each of the four surveys said they preferred EBT. In the Late Demonstration survey, which occurred while many retailers were lobbying to get the EBT system extended, EBT is preferred by more than a three-to-one margin.

It is particularly interesting that retailers preferred the EBT system so strongly in the first two interview waves, which were conducted during a period of numerous system problems. The system was inaccessible for periods of a few minutes to a few hours on a number of occasions in the first few months, and response times were quite slow during transaction peaks immediately after issuance. Retailers expressed great concern about these problems, in the survey as well as to the system operators. EBT preferences remained high nonetheless, indicating apparent retailer expectations that the startup problems would be resolved. In fact, when the Early Demonstration interview forced a choice between EBT and coupons, the "no preference" respondents in other surveys came out for the EBT system.

Supermarkets and convenience stores tended to be the strongest proponents of EBT, as illustrated in Exhibit 5-2. More than 70 percent of supermarkets preferred EBT in all survey waves. Nonetheless, even grocery stores, the group that least favored EBT, preferred EBT by more than a two-to-one margin over coupons. Although the exhibit is based on responses to the last survey, the pattern of preferences by store type changed little over time.

Exhibit 5-1

Retailer Preferences for EBT vs. Coupons

	EBT	Coupon	No Preference	Number of Stores
Startup (months 2-3)	60.9%	25.0%	14.1%	(92)
Early Demonstration (months 4-6)	73.8	26.2	N.A.	(107)
Interim (months 9-10)	60.6	25.0	14.4	(104)
Late Demonstration (months 13-15)	65.7	19.5	14.8	(108)

Source: Retailer interviews.

Exhibit 5-2

**System Preference by Major Store Type:
Late Demonstration Period**

Preference	Supermarket	Grocery Store	Convenience Store	Other	All Stores
EBT	78.9%	58.8%	68.4%	68.4%	65.7%
Coupon	5.3	27.5	10.5	21.1	19.5
No Preference	15.8	13.7	21.1	10.5	14.8
Number of Stores	(19)	(51)	(19)	(19)	(108)

Source: Late Demonstration interviews.

Benefits and Drawbacks. The benefits retailers initially expected from the EBT system were largely mirrored in their subsequent responses. Retailers continued to emphasize reduced fraud and abuse and the elimination of cash change as major benefits. Similarly, the grocers noted reduced handling time and the convenience of not having to take coupons to the bank for deposit.

Regarding drawbacks, retailers' experiences differed considerably from their expectations. The predemonstration concerns about recipients not being able to understand the system were not repeated. The responses focused on system down time and slowdowns in the early surveys, and later on the difficulty of reconciling EBT deposit information.

RETAILERS' PERCEPTIONS OF EBT PROBLEMS AND PRIORITIES FOR IMPROVEMENT

Throughout the evaluation, retailers were asked about problems with the EBT system. Based on responses to the early waves of interviews, an inventory of problems was constructed. Retailers were shown the list in subsequent interviews and were asked to rate each problem as serious, minor, or no problem. Of greatest interest here are the responses in the Late Demonstration interviews, when the EBT system was most mature and retailers had the longest perspective on problems.

The problem most frequently cited as serious was the difficulty of reconciling deposit information with store records (22 percent). Closely related to this problem is the perception that information on the amount of deposits comes too slowly; 15 percent of retailers considered this to be a serious problem. The most frequently mentioned minor problem was that recipients forget their balance and have their transactions rejected for insufficient funds (65 percent). Also mentioned frequently were slow response times (46 percent), more than one try needed to establish contact with the EBT Center (44 percent), and damaged customer cards (43 percent). Thus, the minor problems were generally those associated with the purchase transaction itself, while the major concern focused on the subsequent reconciliation.

Not surprisingly, retailers' priorities for system improvement reflect their perceptions of system problems. In the Late Demonstration interview, retailers were presented with a list of potential improvements to

the EBT system. The list, which was constructed largely from grocers' responses to previous interviews, included:

- reduce the number of slowdowns and system failures;
- speed up processing time when the system is operating normally;
- make manual transactions easier;
- raise the \$35 limit on manual transactions;
- get daily reports on EBT deposits;
- have EBT deposits correspond to the calendar day (this would delay deposits to the store's bank account by one extra day);
- get more reliable in-store equipment;
- get more telephone lines;
- have more than one store card for a store;
- have better training for grocers in using the EBT system; and
- have better training for recipients.

Retailers were asked to rate each potential improvement as being extremely important, important, of little importance, or not important based on their store's requirements. They also were asked to select the improvement which they considered to be most important.

Three of the potential alterations received most of the interest: having EBT deposits correspond to the calendar day, curtailing system slowdowns, and getting daily reports on EBT deposits. Nearly three-quarters of the grocers chose one of these as the most important modification (Exhibit 5-3). Respondents from supermarkets and convenience stores felt particularly strongly about the deposit-related procedures, while the grocery stores and other establishments put more emphasis on reducing slowdowns. Supermarkets and convenience stores, in general, rated more improvements "extremely important" than did the other types of stores, apparently expressing a greater need for a smoothly functioning system.

Exhibit 5-3

Most Important Improvement by Major Store Type

Major Store Type					
EBT Improvements	Super-	Grocery	Convenience	Other	Total

Have deposits correspond to calendar day	42.1%	24.0%	29.4%	20.0%	27.7%
Reduce slowdowns	21.1	32.0	17.6	26.7	26.7
Get daily reports	21.1	14.0	35.3	13.3	18.8
Speed up normal processing	5.3	12.0	0.0	0.0	6.9
More phone lines	0.0	8.0	0.0	13.3	5.9
Make manual transactions easier	0.0	4.0	5.9	6.7	4.0
Better recipient training	0.0	0.0	5.9	13.3	3.0
Better grocer training	5.3	0.0	0.0	0.0	1.0
Other responses	5.0	6.0	5.8	6.6	6.9
Number of stores	(19)	(50)	(17)	(15)	(101)

5.2 EBT EFFECTS ON CHECKOUT COSTS

Retail food merchants pay a great deal of attention to procedures at the checkout counter. "Front-end" labor costs for cashiers make up a substantial part of store operating costs. Equally important, market research has shown that customers are very sensitive to the length of time they spend waiting to make their purchases. Low checkout productivity thus translates into both higher operating costs and lost revenue.

Cash is the dominant -- and the preferred -- mode of payment for nearly all food retailers. Personal checks and manufacturers' coupons take longer at the checkout counter and add handling costs later. Food stamp coupons have the same effects. Thus, retailers might welcome an EBT system if it allows faster checkouts than with coupons, and object if EBT makes the process even longer.

The analysis presented in this section addresses several questions related to the EBT system's effect on checkout time, including:

- How long does it take the cashier to handle a routine food purchase (i.e., one with no unusual problems) when the customer pays with cash, food stamp coupons, or EBT benefits?
- How often do problems occur in EBT purchases, and how do these problems affect the comparison of average times for cash, coupon, and EBT purchases?
- What is the cost in cashier wages of any extra time required for coupon or EBT purchases above the time required for cash purchases?
- Do retailers believe the EBT system improves or lowers their checkout productivity, compared with coupons?

Before presenting the analysis results, the section briefly reviews checkout procedures in the coupon and EBT systems and the research methods used.

PURCHASING FOOD WITH FOOD STAMP BENEFITS

Some basic rules for using food stamp benefits at the checkout counter apply to both coupons and EBT cards. For example, grocers participating in the Food Stamp Program are expected to treat food stamp recipients the same way they treat cash customers: they cannot have separate lines for food stamp customers or accept food stamps only during certain hours.

Recipients may use food stamp benefits to purchase authorized items. They cannot use benefits to buy other items such as paper or soap products, alcoholic beverages, vitamins, medicine, food that will be eaten in the store where it is purchased, hot foods ready to be eaten, or food designed to be heated in the store. Stores in Reading typically require the recipient to separate any unauthorized items from the purchase. The cashier totals these separately for cash purchase. Stores with scanner systems or a "food stamp" key on the cash register usually do not require separation of the purchase, because the system automatically distinguishes between authorized and unauthorized items.

Coupon Procedures. Recipients using food stamp coupons present them to the cashier to purchase eligible food items. State agencies issue identification cards to food stamp recipients, and cashiers may ask to see this card if they doubt that the person using the coupons is actually a recipient.

At the time of purchase, either the cashier or the recipient rips the coupons out of a book. The cashier cannot accept loose \$5 or \$10 dollar coupons unless the recipient has the book from which the coupons came (their serial number will match that on the book). Cashiers can accept loose \$1 coupons. Any change over \$1 must be given in \$1 food stamp coupons; \$5 and \$10 coupons cannot be given as change.

EBT Procedures. Recipients present the EBT card to the cashier before, during, or after the cashier rings up the order. The cashier is supposed to check the picture on the card to verify that it is the customer's card. If the customer is not the recipient, the customer must present a valid Alternate Shopper Card.

After checking the picture, the cashier passes the card through a Benefit Transfer Terminal (BTT). The recipient must then enter the four-digit Personal Identification Number on an attached PIN-pad. The BTT checks to see whether the PIN is correct; if it is not, the customer must try again.

A customer who enters an incorrect PIN three consecutive times must wait until someone else has used the BTT or move to a BTT in another checkout lane. The customer then has another three chances. A recipient may try nine times in one day to enter the correct PIN. After the ninth try, the central computer locks the account against balance inquiries for the rest of that

day. EBT purchases still are possible, however, upon entry of the correct PIN.

When the customer enters the correct PIN, the BTT responds with the message, "Select Function." The cashier presses the "Purchase" (or other appropriate) key. The BTT responds "Enter Amount." The cashier enters the amount and presses the "Send" key. The BTT connects with the computer at the EBT Center to get authorization for the purchase. Upon authorization, a printer produces a receipt listing the amount of the purchase and the balance remaining in the recipient's account.

If the intended purchase exceeds the balance in the recipient's account, the BTT display will say "Insufficient Funds". By pressing "Scroll" the cashier can find out the discrepancy. The recipient can then make up the difference with another form of payment, remove some items from the order, or stop the transaction. If the recipient still wants to use food stamp benefits, the electronic transaction must be re-initiated.

When the system is not functioning properly, the cashier can perform a manually authorized transaction for a maximum of \$35 per household each day. To perform a manual transaction, the cashier calls the EBT Center, where an operator checks to see whether the recipient has a valid account with an adequate balance to cover the purchase (if the main computer is down, the operator checks the most recent printout of accounts). When the operator authorizes the purchase, the cashier fills out a manual authorization slip listing the recipient's name, the amount of the transaction, and the authorization number. Finally, the recipient signs the slip to complete the transaction.

Occasionally the cashier may have to process a refund. This can occur if a recipient returns an item or if the cashier accidentally overcharges the customer and processes the transaction. To issue a refund, the cashier (or the manager) must use the store's EBT card and must enter the store's PIN. The cashier then passes the recipient's card through the card reader, and the recipient enters his or her PIN. The clerk enters the amount of the refund and presses the "Refund" key. The BTT prints out a receipt, and the computer system credits the appropriate amount to the recipient's account.

METHODOLOGY

Most of the analysis presented in this section is based on observations of checkout procedures. A trained observer stood at the end of the checkout counter with a stopwatch and recorded the time each transaction began and ended, certain intermediate times (e.g., when payment began and ended), and characteristics of the transaction, such as the number of items, the means of payment, how bagging was handled, and whether any problems occurred.

Observations were conducted early in the demonstration, when the EBT system had been operating for 3 to 5 months, and again after 11 to 14 months of operations.¹ Observations were concentrated in the days immediately following issuance in order to maximize the number of food stamp transactions observed.² In each wave, observations were carried out in 29 participating stores and 10 stores in Allentown, a nearby city similar to Reading but without an EBT system. The analysis for each wave is based on more than 5,000 purchase observations, including about 150 coupon purchases, mainly from comparison stores, and 160 to 230 EBT purchases (the smaller number of EBT purchases occurred in the Late Demonstration wave, when benefits were issued on two days rather than one). For more detail on the checkout observation data, see Appendix V-A (pp. V-7-8).

These data are used in regression analyses of two dependent variables:

- the total time of the transaction, from the start of the order through ringing, paying, and bagging to the end of the order; and

¹An initial round of observations occurred before the demonstration began. These were intended to ensure that the number of observed coupon transactions would be sufficient for analysis. As it turned out, sufficient coupon transactions were captured in the later observations, so the initial round of observations is not included here.

²Because peak loads on the EBT system occurred immediately after issuance, the observation data might overestimate the normal duration of checkout time or incidence of problems. To test this hypothesis, hourly transaction volumes were examined in conjunction with transaction time. No relationship was found, however.

- payment time, from the time the cashier determines the total amount of the purchase to the time the customer receives the receipt and any change.

The effects of food stamp coupons and the EBT card proved too complicated to summarize by using single indicator variables for these two forms of payment. Instead, each is represented by three indicators:

- EBT card (or food stamp coupons) only;
- EBT card (or food stamp coupons) in combination with cash; and
- EBT card (or food stamp coupons) in combination with any other form of payment.

The variables used in the regression models are listed in Exhibit 5-4. Appendix V-B (pp. V-17-28) discusses the variables and the regression methodology further.

Separate regression models are estimated for supermarkets, grocery stores, and convenience stores. A weighting procedure, reflecting the total volume of food stamp sales in each category, was used in developing overall estimates. Appendix V-B (pp. V-28-36) describes the procedure used and presents the regression results by store type.

TIMES FOR ROUTINE PURCHASES

To understand the effects that one might expect in a stable EBT system, it is appropriate to examine the total time and payment time in routine transactions. We define routine transactions as those that (1) involve no problems with the EBT system, (2) do not involve any other unusual circumstances or events, and (3) do not have an average price per item of less than 10 cents. The next section discusses nonroutine transactions involving the EBT card, and a later section estimates the average effect after combining routine and nonroutine transactions.

The general form of the regression models is described in Appendix V-B (pp. V-17-28). Exhibit 5-5 lists the estimated coefficients from the regression analysis of total time. Similarly, Exhibit 5-6 records the estimated coefficients from the regression of payment time. The regression coefficient for an explanatory variable indicates the average amount that the dependent variable (here, total time) changes in response to a change of one

Exhibit 5-4

Explanatory Variables in the Regression Analysis

Forms of Payment (and Combinations of These)

Constant (represents payment in cash)
EBT card only
EBT card and cash (but no other forms of payment)
All other combinations of payment forms that include the EBT card
Food stamp coupons only
Food stamp coupons and cash (but no other forms of payment)
All other combinations of payment forms that include food stamp coupons
Check
Other coupons
Other form of payment

Variables Involving the Number of Items

Number of items
Number of items, when only cashier does bagging
Number of items, when no bagging takes place

Events During Ringing

Price checks (indicator variable)
Produce weighing (indicator variable)

Other Variables (all indicators)

Presence of a problem with EBT system
Other nonroutine circumstances or events
"Long" transaction (observer noted unusually long transaction, but no problem)
"Penny candy" transaction (average price per item less than 10 cents)

Exhibit 5-5

Regression Model for Total Time (in seconds) per Routine Transaction:
All Stores (weighted)

Explanatory Variable ^a	Coefficient from Early Demonstration	Coefficient from Late Demonstration
Constant	17.3***	21.5***
EBT card only	35.3***	33.8***
EBT card and cash	72.1***	87.0***
EBT Card, other combinations	-1.0	30.2
Food Stamp (FS) coupons only	11.2***	15.9***
FS coupons and cash	43.7***	87.5***
FS coupons, other combinations	97.3***	47.6***
Check	28.5***	25.8***
Other coupons	13.2***	7.2***
Number of items	3.76***	3.61***
Items, only cashier bagging	1.48***	1.07***
Items, no bagging	-1.61***	-1.94***
Price checks	34.3***	27.8***
Produce weighing	10.3***	13.5***
R ²	0.864	0.840
Number of Transactions	(4808)	(4655)

^aThese samples did not involve "other form of payment" in either demonstration period.

Source: Checkout observations, Early and Late Demonstration.

Statistical significance: *, P < 0.05; **, P < 0.01; ***, P < 0.005.

Exhibit 5-6

Regression Model for Payment Time (in seconds) per Routine Transaction:
All Stores (weighted)

Explanatory Variable	Coefficient from Early Demonstration	Coefficient from Late Demonstration
Constant	20.1***	21.6***
EBT card only	40.5***	29.1***
EBT card and cash	62.2***	36.0***
EBT card, other combinations	23.6***	24.7
Food Stamp (FS) coupons only	14.2***	18.8***
FS coupons and cash	36.8***	42.3***
FS coupons, other combinations	69.8***	20.7***
Check	34.4***	38.9***
Other coupons	-1.8*	-0.9***
Number of items	0.41***	0.37***
R ²	0.437	0.435
Number of Transactions	(4674)	(4484)

Source: Checkout observations, Early and Late Demonstration.

Statistical significance: *, P < 0.05; **, P < 0.01; ***, P < 0.005.

unit in that explanatory variable (in the presence of the other explanatory variables). Because a form of payment (e.g., "EBT card and cash" or "check") is either present or absent in a transaction, the corresponding coefficient tells how much that form typically adds to total time when present, relative to the time for a cash transaction. The coefficients for "price checks" and "produce weighing" have the same interpretation. For the variables involving items, the coefficient reflects the typical increase per item. The value of the constant term may be viewed as the "baseline" time for a cash transaction with none of the special conditions represented by the other variables in the model. R^2 summarizes the effectiveness of the regression model in accounting for the variation in total time observed in the data. It is the proportion of (squared) variation accounted for by the model.

Purchases in which the customer pays entirely with food stamp benefits take about 20 seconds longer with the EBT system than with coupons. The difference varies across store types and time periods, but generally falls in the range of 20-30 seconds. These differences are statistically significant. When the recipient pays for part of the purchase with cash, differences between EBT and coupon transactions generally are not statistically significant. These patterns are shown in Exhibit 5-7, which summarizes results from Exhibits 5-5 and 5-6 and Appendix V-B (p. V-11).

Both EBT and coupon purchases take longer than comparable cash transactions. On average, total transaction time is 3 to 18 seconds longer when the customer pays only with food stamp coupons than paying only with cash (the larger increments are statistically significant). Transactions involving only EBT payment take 30 to 45 seconds longer than cash-only transactions; these incremental time estimates are all statistically significant.

Combined transactions, in which the recipient pays for part of the purchase with food stamp benefits and the rest with cash, would be expected to take longer than purchases involving just food stamp benefits. The data generally support this expectation. However, no clear difference emerges between the EBT and coupon systems in the amount of extra time required for dual-mode as opposed to single-mode payment. This is probably because the proportion paid with cash varies from purchase to purchase, causing the overall time to fluctuate; the data do not measure the proportion of the purchase paid with cash.

Exhibit 5-7

Time Increments of Routine Card and Coupon Transactions
(Relative to Cash Transactions), Increments in Seconds Per Transaction

	Supermarkets		Grocery Stores		Convenience Stores		All Stores ^a	
	Early Demo	Late Demo	Early Demo	Late Demo	Early Demo	Late Demo	Early Demo	Late Demo
<u>Total Time</u>								
Card only	32.4	36.8	34.6	29.7	45.4	38.3	35.3	33.8
Coupons only	12.6	18.4	8.0	7.3	2.6	7.7	11.2	15.9
Difference	19.8**	18.4	26.6***	22.4***	42.8***	30.6***	24.1***	17.9***
Card and cash	72.6	93.2	67.1	45.0	27.9	46.1	72.1	87.0
Coupons and cash	43.8	91.2	40.4	28.0	43.4	28.9	43.7	87.5
Difference	28.8***	2.0	26.6*	17.0	-15.5	17.2	28.4***	-0.5
<u>Payment Time</u>								
Card only	41.7	23.6	39.0	36.7	37.7	36.1	40.5	29.1
Coupons only	17.2	21.7	7.9	4.7	4.5	6.2	14.2	18.8
Difference	24.5***	1.8	31.1***	32.1***	33.2***	29.9***	26.3***	10.3***
Card and cash	64.4	37.2	42.5	23.7	-5.4	--	62.2	36.0
Coupons and cash	37.9	42.7	24.2	--	--	30.1	36.8	42.3
Difference	26.5***	-5.5	18.3	--	--	--	25.4***	-6.2

^aEach store type has been weighted according to its relative food stamp volume.

Source: Early and Late Demonstration observation data. Regression coefficients come from Exhibits 5-5 and 5-6 and Appendix V-B.

Statistical significance: *, $P < 0.05$; **, $P < 0.01$; ***, $P < 0.005$. (These significance levels are individual levels. That is, they apply only to the individual test. To make a conservative allowance for the multiplicity of having k simultaneous tests, one can allocate the customary 0.05 level equally among the tests and call a test "significant" only if its P -value is less than $0.05/k$. In the present exhibit, $0.05/32 = 0.00156$, and all differences marked *** remain significant by this criterion except that for food stamp benefits and cash at supermarkets during the Early Demonstration period.)

In combination with cash, the EBT card usually but not always adds more to total transaction time than do coupons. The Early Demonstration difference is statistically significant for supermarkets and grocery stores, but the Late Demonstration difference is smaller and not significant. Neither period shows a significant difference in convenience stores, primarily because the small number of these transactions means that the differences are not well determined in the analysis.

Because this analysis concerns routine transactions only, no major difference would be expected between the Early and Late Demonstration periods. PRC made a number of improvements to the EBT system between the two periods, but the changes were aimed largely at reducing the frequency and severity of problem transactions. Supporting this expectation, the data generally show very small differences between periods in the incremental time (compared with cash) for EBT-only transactions. None of these between-period differences are statistically significant.

The analyses of payment time generally yield very similar results to those for total transaction time. That is, differences in the length of time required for the payment part of the transaction translate directly into differences in the total time required to complete the purchase. In some cases, the cashier might bag groceries while waiting for the EBT system to respond to the authorization request. Such overlaps would tend to reduce total time increments relative to increments in payment time. No systematic pattern of this sort is visible, however.

In supermarkets, the extra payment time required for an EBT-only purchase, compared with a cash purchase, is roughly the same as the extra time for payment by check. Meaningful comparisons are not possible in the other types of stores, because payment by check is quite rare and the estimated incremental time fluctuates substantially.

In sum, routine purchases made with food stamp benefits take longer at the checkout counter than comparable cash purchases. Food stamp coupon purchases take 11 to 16 seconds longer on average. EBT purchases take 18 to 24 seconds longer than coupon purchases. Purchase time increases further when the recipient pays partly with cash and partly with food stamp benefits, but there is no consistent difference between EBT and coupons in this situation.

PROBLEM TRANSACTIONS

Although routine EBT purchases take roughly 20 seconds longer than purchases with coupons, recipients using the EBT system may encounter a variety of problems that lengthen the transactions. This section describes the problems and their impact.

EBT problems that add extra time to transactions may occur because of system malfunctions, incorrect store procedures, or recipient mistakes. System problems include in-store equipment malfunctions (usually of the terminal or printer), reswipes of damaged cards, slow system response, and system downtime. Store personnel do not always follow correct procedures, and new employees are sometimes unsure how to operate EBT equipment. Even experienced personnel may forget to turn on a terminal or may let the printer run out of paper.

Recipients also can delay EBT transactions. They may forget their PIN, attempt a purchase that exceeds the balance in their account, or take time for a balance inquiry at the checkout counter. Recipients may not understand the system and may ask the cashier questions or try to argue about their account balance. People shopping for the recipient may forget their Alternate Shopper cards. Other problems may also occur that were not captured in the observation data.

Average Delays with Problem Transactions. Analysis of the observation data indicates that, although the frequency of problem transactions did not change much between the Early and Late Demonstration periods, the average length of the delays declined dramatically.

Overall, 16 percent of the observed EBT purchases involved some kind of problem (Exhibit 5-8). System-related problems, such as a failure to establish connection with the EBT Center computer, were the most common problems in the Early Demonstration observations. Recipient problems, such as forgetting the PIN, were second to system problems in the earlier period, but they were the largest category of problems in the Late Demonstration observations. It is interesting to note that the retailers, in survey responses, perceived these recipient-related problems as common but not very important.

Exhibit 5-8

Frequency and Estimated Delay for Problems Observed in EBT Transactions

Problem	Frequency		Mean Delay in Seconds	
	Early Demo	Late Demo	Early Demo	Late Demo
<u>System/Equipment/Card</u>	<u>8.3%</u> ^b	<u>4.9%</u>	<u>394.3</u>	<u>69.1</u>
-equipment or system down	3.5	0.6	264.2	6.7
-reswipe	3.0	4.3	196.8	78.0
-slowdown	1.3	0.0	1327.0	--
-receipt problem	0.4	0.0	19.5	--
<u>Store Procedures</u>	<u>3.5</u>	<u>4.9%</u> ^b	<u>110.8</u>	<u>9.3</u>
-sign-on (BTT off)	1.7	3.1	19.9	-91.8 ^c
-refill paper	0.9	0.0	259.6	--
-confusion	0.9	1.9	143.6	177.8
<u>Recipient Procedures</u>	<u>6.5</u>	<u>8.0</u>	<u>131.9</u>	<u>67.1</u>
-insufficient balance	1.3	3.1	97.0	118.1
-balance check	0.4	1.2	21.5	148.6
-PIN	3.5	3.7	110.8	-2.6
-discussion	0.9	0.0	64.0	--
-alternate shopper card	0.4	0.0	651.5	--
<u>Total</u>	<u>18.2%</u>	<u>17.9%</u>	<u>246.6</u>	<u>51.7</u>
<u>Weighted Total</u> ^a	<u>16%</u>	<u>16%</u>		
Total # of problem EBT transactions	42	29		
Total # of EBT transactions	230	162		
Total # of all transactions	5,233	5,069		

^aWeighted to reflect the distribution of total transactions among store types.

^bTotals may not add because of rounding of numbers.

^cNegative values occur if the actual transaction time is shorter than the time predicted on the basis of other characteristics of the transaction.

Source: Early and Late Demonstration observation data. See Appendix V-B for procedure used in estimating delay times.

Note: Problem transactions are expressed as a percentage of all EBT transactions in the wave.

To estimate the importance of EBT problems, we use the regression model of routine transactions (Exhibit 5-5) to predict the expected length of time for each EBT transaction, based on the number of items and other characteristics of the transaction. For those transactions with observed problems, the predicted time is subtracted from the actual time for the transaction. The residual value is the estimate of the delay caused by the EBT problem.

The mean estimated delays for each type of problem are shown in Exhibit 5-8. The estimates for specific types of problem must be treated with great caution because of the small numbers of observations (42 problem transactions in the Early Demonstration data and 29 in the Late Demonstration). Because the analysis technique compares the actual transaction with an "expected average," negative values can occur. A negative value simply means that a transaction went more quickly than would have been expected, despite a problem. It does not mean that the problem reduced the transaction time.

The average EBT problem during the Early Demonstration period caused an average delay of more than four minutes. In contrast, delays in the Late Demonstration transactions averaged less than one minute. This difference is statistically significant.

The estimates suggest that severity of problems declined for all major groups of problems, but especially for problems with the EBT system and the card. The 19 Early Demonstration transactions observed with system, equipment, or card problems took an average of nearly 7 minutes longer than would have been expected. The 8 Late Demonstration transactions with similar problems lasted an average of just over a minute longer than expected. The average delays for store problems and recipient problems also declined by more than a minute.

Impact of Delays on Average EBT Purchase Times. The importance of EBT problems was diminished not only by reductions in the average length of delays, but by changes in the kinds of problems observed. System problems in particular, which caused the longest delays in the Early Demonstration observations, made up a smaller proportion of the Late Demonstration problems.

The two factors combine to reduce dramatically the delay that the average EBT transaction encountered. Counting both problem and routine transactions, the average EBT purchase in the Early Demonstration had a delay

of about 45 seconds (beyond the incremental time required for a routine transaction). The average delay drops to about 12 seconds in the Late Demonstration observations. Most of the difference comes from the reduced incidence of problems with the EBT system, store equipment, or EBT card.

ESTIMATED RETAILER COSTS

The extra time required for coupon and EBT transactions has costs to retailers. If food stamp purchases take longer than cash transactions, customers wait longer in the checkout line. When a line gets very long, stores usually open another checkout. An employee who was doing another job must then work as a cashier. The opportunity cost of using this employee as a cashier constitutes a cost of participating in the Food Stamp Program. This section presents estimates of these participation costs.

Average Time for a Typical Purchase. To estimate EBT effects on checkout costs first requires estimating the average time for EBT, coupon, and cash purchases. Earlier sections have shown estimates for routine purchases with food stamps only and cash plus food stamps, as well as the impact of EBT problems. These factors must now be combined into an overall estimate of time required for the average transaction. To avoid the confusion that would result if the characteristics of the average EBT transaction differed from those of the average coupon transaction or the average cash transaction, the analysis focuses on the average EBT transaction. After determining the characteristics of a typical EBT transaction in each store type, it uses the regression models to estimate the total time required for that transaction. Parallel calculations treat the same typical transaction as if food stamp coupons were being used instead of the EBT card, and then as if cash alone were used. Appendix V-B (pp. V-11-17) describes the procedure, and Exhibit 5-9 presents the estimates.

Food stamp purchases in supermarkets are substantially larger than purchases in grocery and convenience stores. Total transaction times are therefore longer in supermarkets, ranging from three to five minutes, whereas transactions elsewhere range from half a minute to two minutes.

As would be expected from previous analyses, food stamp purchases consistently take longer than equivalent cash purchases. EBT purchases took 74 to 96 seconds longer than equivalent cash purchases in the Early Demonstra-

Exhibit 5-9

**Total Time (in seconds) for Typical EBT Transactions
when Treated as EBT, Coupon, or Cash Transactions**

	Supermarket	Grocery	Convenience	All Stores ^a
Early Demonstration				
EBT	304.3	124.5	109.1	239.7
Cash	<u>208.0</u>	<u>50.0</u>	<u>28.5</u>	<u>150.9</u>
Incremental EBT time	96.3	74.5	80.6	88.8
Coupon	241.5	58.9	31.9	178.2
Cash	<u>208.0</u>	<u>50.0</u>	<u>28.5</u>	<u>150.9</u>
Incremental coupon time	33.5	8.9	3.4	27.3
EBT increment minus coupon increment	62.8***	65.6***	77.2***	61.5***
Late Demonstration				
EBT	243.9	82.0	83.1	188.9
Cash	<u>177.4</u>	<u>45.6</u>	<u>41.0</u>	<u>133.6</u>
Incremental EBT time	66.5	36.4	42.1	55.3
Coupon	240.3	54.5	49.8	184.7
Cash	<u>177.4</u>	<u>45.6</u>	<u>41.0</u>	<u>133.6</u>
Incremental coupon time	62.9	8.9	8.8	51.1
EBT increment minus coupon increment	3.6	27.5***	33.3***	4.2

^aEach store is weighted according to its relative food stamp volume.

Source: Checkout observations, Early and Late Demonstration.

Statistical significance: *, P < 0.05; **, P < 0.01; ***, P < 0.005.

tion period, and 36 to 67 seconds longer in the later period. The decline in EBT incremental time reflects the reduced delays from EBT problems. Food stamp coupon transactions take 3 to 63 seconds longer than the equivalent cash purchases.

The typical EBT purchase took considerably longer than the equivalent coupon transaction in the Early Demonstration period. The difference was statistically significant and more than a minute for all three store types. In the Late Demonstration, however, the largest estimated difference was about half a minute in convenience and grocery stores. The difference for supermarkets was less than 10 seconds.

Estimated Cost of Checkout Times -- Full Opportunity Cost. One way to estimate stores' food stamp participation costs is to multiply the extra checkout time required for coupon and EBT purchases by the value of cashier wages. This assumes that all cashier time has an opportunity cost -- i.e., that the cashier could be doing something productive with the time, not simply waiting for another customer to appear. Estimates based on this assumption are considered the "full cost" of the incremental time required for food stamp purchases.

To estimate participation costs per \$1000 of benefits redeemed, we multiply average participation costs per transaction by the number of transactions per \$1000 of benefits redeemed.

The extra time for EBT transaction translates into an average retailer participation cost of \$6.31 per \$1000 of benefits redeemed during the Early Demonstration period (Exhibit 5-10). The cost declines by nearly 40 percent, to less than \$4 in the Late Demonstration data. Appendix V-B (pp. V-21-27) presents the details of this analysis.

The EBT participation cost varies dramatically by store type, from less than \$3 per \$1000 of benefits redeemed in supermarkets to more than \$17 in convenience stores (Late Demonstration estimates). This pattern occurs because recipients make larger purchases in supermarkets, on average, and smaller purchases in convenience stores. Hence, \$1000 in redemptions implies an average of 42 purchases in supermarkets, 135 in grocery stores, and 270 in convenience stores. Because the time added by each EBT transaction varies little by store type, the extra time is inevitably greatest in convenience

Exhibit 5-10

Retailer Checkout Cost: Full Cost per \$1000 of Benefits Redeemed

	Supermarket	Grocery	Convenience	All Stores ^a
Early Demonstration				
EBT	\$4.09	\$10.26	\$33.43	\$ 6.31
Coupon	1.42	1.22	1.43	1.94
Difference (EBT-Coupon)	2.67***	9.04***	32.00***	4.37***
Late Demonstration				
EBT	\$2.83	\$5.02	\$17.44	\$3.93
Coupon	2.67	1.22	3.65	3.63
Difference (EBT-Coupon)	0.16	3.80***	13.79***	0.30

^aEach store type is weighted according to its relative food stamp volume.

Source: Appendix V-B.

Statistical significance: *, $P < 0.05$; **, $P < 0.01$; ***, $P < 0.005$.

stores and least in supermarkets. (Conversely, if an EBT system were faster than cash, the time and cashier wages saved would be greatest in convenience stores.)

In the coupon system, participation costs depend less on store type. Incremental times for coupon purchases are greater in supermarkets and less in convenience stores (Exhibit 5-9), and this difference counterbalances the smaller number of purchases per \$1000. Coupon costs differ over time, however: the Late Demonstration estimates substantially exceed the Early Demonstration estimates in supermarkets and convenience stores. The cause of the time trend is unclear. However, because most coupon transactions were observed in the comparison stores in Allentown, the difference is unlikely to represent an EBT effect.

Retailer participation costs were consistently higher with EBT than with coupons. For all stores combined, EBT costs are \$4.37 higher per \$1000 in benefits redeemed in the Early Demonstration period, and 30 cents higher in the Late Demonstration. All EBT/coupon differences are statistically significant except the supermarket and all-store comparisons in the Late Demonstration period. The narrower Late Demonstration gap results from less severe EBT system problems and longer coupon transaction times.

Estimated Cost of Checkout Times -- Limited Opportunity Cost. Not all of the extra time for food stamp transactions involves extra retailer expenditures. In some cases, the cashier would not be productively engaged for the extra time, so there would be no opportunity cost.

For estimation purposes, we assume that if a food stamp transaction ends more than 20 seconds before the cashier begins dealing with the next customer, any incremental time for the food stamp transaction did not impose an opportunity cost. To estimate the limited opportunity costs for EBT and coupon purchases, full incremental times for each store type and wave are multiplied by the proportion of EBT and coupon transactions followed by a gap of less than 20 seconds. Appendix V-B (pp. V-16-27) describes the procedures used.

The limited opportunity cost estimates range from \$.22 to \$1.88 per \$1000 of benefits redeemed for coupons, and from \$1.76 to \$5.02 with EBT (Late Demonstration estimates). Exhibit 5-11 shows these figures.

Exhibit 5-11

**Retailer Checkout Cost: Limited Opportunity Cost Per
\$1000 of Benefits Redeemed**

	Supermarket	Grocery	Convenience	All Stores ^a
Early Demonstration				
EBT	\$2.55	\$4.53	\$15.50	\$3.32
Coupon	0.94	0.32	0.62	0.90
Difference (EBT-Coupon)	1.61***	4.21***	14.88***	2.42***
Late Demonstration				
EBT	1.76	1.79	5.02	1.85
Coupon	1.88	0.22	1.38	1.60
Different (EBT-Coupon)	-0.12	1.57***	3.64***	0.25

^aEach store type is weighted according to its relative food stamp volume.

Source: Appendix V-B.

Statistical significance: *, $P < 0.05$; **, $P < 0.01$; ***, $P < 0.005$

The limited opportunity costs generally follow the pattern of the full cost estimates, but with smaller differences between the store types. EBT costs are still consistently higher than coupon costs (except the Late Demonstration estimate for supermarkets, which is not statistically significant). Similarly, the EBT-coupon cost difference remains greatest in convenience stores, but declines from nearly \$14 to under \$4 per \$1000 of benefits redeemed.

RETAILERS' PERCEPTIONS OF CHECKOUT PRODUCTIVITY EFFECTS

The observation data generally indicate that the EBT system reduced productivity at the checkout counter, but that the impact on retailers' business was small. Retailers' responses to survey questions tell much the same story.

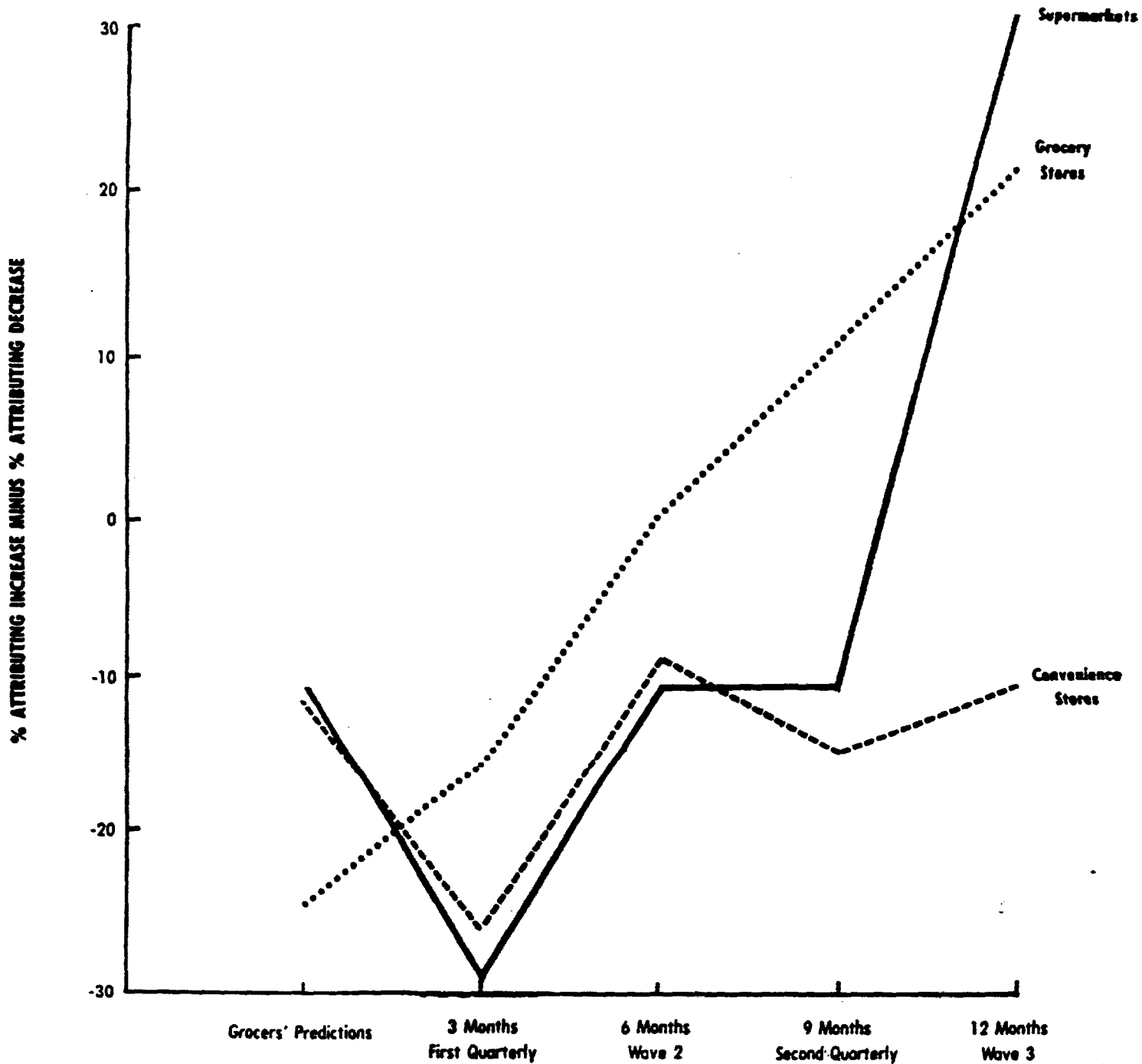
Before the EBT system began operating, interviewers asked the grocers to predict the system's impact on checkout productivity. The majority (60 percent) expected no impact. Most of the remainder were pessimistic; 30 percent expected a decline in productivity and only 10 percent expected improvement. In subsequent interviews, "no impact" remained the grocers' predominant opinion of the system's actual effects. Some grocers did see effects, however, and the pattern of those perceptions over time is revealing.

Retailers reporting any EBT impact in the first three months of system operations were overwhelmingly negative; 24 percent felt the EBT system caused a decline in productivity, compared with only 1 percent reporting an improvement. The perceived effects were still negative in early 1985, although fewer grocers reported any effect. Even fewer saw productivity changes between the spring and summer of 1985, but those few were about evenly split between perceived improvements and perceived declines. Finally, asked late in 1985 about changes since July, nearly a quarter thought productivity had changed, most feeling it had improved. This general pattern fits well with the problems that the EBT system experienced in the first few months and the modifications made in the late spring and summer of 1985.

Responses differed by store type, as illustrated in Exhibit 5-12. Supermarkets showed the widest range of opinions, and apparently the greatest sensitivity to the efficiency of the system. Supermarket respondents gave the least negative prediction of the EBT system's impact on checkout productiv-

EXHIBIT 5-12

RETAILERS' PERCEPTIONS OF THE EFFECTS OF THE EBT SYSTEM ON CHECKOUT PRODUCTIVITY



NOTE: Graph superimposes changes from survey to survey

ity. They expressed the most negative opinions at the beginning of system operations, but saw the most improvement by the end, when they were also the most vocal supporters of extending the EBT system's life. Convenience stores expressed the most negative impressions of productivity in the later periods, consistent with the strikingly higher participation costs estimated for these stores.

5.3 EBT EFFECTS ON HANDLING AND RECONCILIATION COSTS

Food stamp purchases differ from cash purchases not only in the procedures used at the checkout counter, but in the special actions retailers must subsequently take to get cash for the benefits they accept. The cost of those actions, another part of the retailer's cost of participating in the Food Stamp Program, is estimated in this section.

HANDLING AND RECONCILIATION PROCEDURES

Coupon System. Food stamp coupons that retailers accept must be counted, bundled, and canceled. The retailer must fill out a Redemption Certificate and deposit the coupons at the bank. Survey responses reveal that the owner/manager typically performs these tasks in small- to medium- grocery stores. In supermarkets and convenience stores, clerks generally count and cancel coupons, which are later recounted and deposited by a head cashier or manager. Reconciliation involves comparing deposit records with bank statements; this is usually done either by the owner/manager or by a bookkeeper or accountant.

EBT System. The EBT system limits retailer handling procedures to account reconciliation. Each day at 2:00 PM, the EBT Center totals stores' credits and begins the funds transfer process. When retailers execute the "Sign Off" function on the BTT, they get a printed record of the purchases and refunds since the BTT was last signed on. To determine the total debits and credits for the EBT banking day, the retailer must sign off the terminal at 2:00 PM, and add the totals to those accumulated after 2:00 PM the previous day. At the end of the month, the grocer can compare the totals with the bank statement, which lists each day's electronic transfers.

In multi-unit operations (that is, most supermarkets and convenience stores) EBT reconciliation takes place at company headquarters. Owner/managers are responsible for reconciliation in most small- to medium-groceries and some convenience stores.

METHODOLOGY

To estimate retailers' food stamp handling and reconciliation costs, the research had to deal with two problems. First, retailers do not keep records of these (or other) food stamp costs. Food stamp purchases are a very small part of most stores' business--rarely more than 10 percent--and the activities associated with food stamps are incorporated into other store activities. The information used in estimating costs therefore comes from interviews. The three in-person interview waves asked retailers, for example, who carries out food stamp handling tasks in their stores, how many hours per week each worker spends, and the wage rate for each worker class. This information yields an estimated monthly participation cost for each store.

The second problem stems from the basic demonstration design which does not allow comparable measures of a store's coupon costs and its EBT costs in a single time period. The Pre-Demonstration period involved coupon costs only. EBT purchases made up the vast majority of the stores' food stamp business in the Early Demonstration and Late Demonstration periods. Some coupon redemptions continued, because recipients living outside the demonstration area still shopped with coupons. The volume was so limited that many retailers had difficulty providing time estimates, although none reported any important differences in their procedures for handling coupons. Accordingly, most analyses of retailer participation costs use Pre-Demonstration data to estimate ATP/coupon costs and Late Demonstration data for the EBT estimate.

Two aggregate measures of participation cost are presented: cost per store per month, and cost per \$1000 in benefits redeemed. Cost per store per month is the sum of handling costs in each store type (or all stores) divided by the number of stores in each type. This is a simple average of all stores in the group.

Cost per \$1000 in food stamp benefits redeemed is the sum of handling costs for all stores in a group divided by the total monthly food stamp volume for the group (in thousands). The cost per \$1000 is thus a

weighted average, with the weights based on the store's food stamp volume. For coupon estimates, food stamp volume is the average monthly coupon volume for July-September, 1984 (when the Pre-Demonstration interviews were conducted). EBT estimates use the average monthly EBT volume for October-December 1985, corresponding to the timing of the Late Demonstration interviews.

ESTIMATED HANDLING AND RECONCILIATION COSTS

Retailers' only substantial cost for handling and reconciling food stamp benefits is the labor cost of carrying out the procedures described above.

At the time of the Pre-Demonstration data collection, banks were permitted to charge retailers for food stamp coupon deposits. About 10 percent of retailers report being assessed such charges; costs for the weighted average of all stores amount to about 16 cents per \$1000 in coupons redeemed in the Pre-Demonstration period. Recent legislation prohibits banks from levying any charges for food stamp deposits, however. This analysis therefore assumes no bank charges either for coupon deposits or for EBT transfers.

One of the grocers' most frequently mentioned reasons for preferring the EBT system is that it involves less handling than the coupon system. The cost estimates which indicate that the EBT system cuts handling costs by more than half, are consistent with this opinion. Stores incur an average of about \$13 in handling and reconciliation costs for each \$1000 of coupons they accept. In contrast, costs average about \$5 per \$1000 of EBT benefits. The patterns are shown in Exhibit 5-13. Although the percentage reductions in costs are large, none of the differences in estimated costs between the two systems is statistically significant.

Some economies of scale appear to exist for both coupon and EBT handling costs. Supermarkets, which have the highest volume of food stamp redemptions, have the lowest cost per \$1000. The establishments in the "other" category, with the lowest volume, have the highest cost. This suggests that some handling and reconciliation tasks--such as completing Redemption Certificates or reviewing bank statements on EBT deposits--take about the same amount of time regardless of the value of redemptions. Because

Exhibit 5-13

Handling and Reconciliation Costs of Coupon and EBT Systems

	Major Store Type				All Stores
	Super-market	Grocery	Convenience	Other	
Average handling time/month (hrs)					
Coupons	10.92	3.80	7.45	8.01	6.13
EBT	5.20	1.44	1.75	2.29	2.30
Average wage (\$/hr)					
Coupons	\$8.72	\$6.22	\$10.72	\$5.66	\$7.22
EBT	8.63	6.22	10.66	5.55	7.40
Average cost/store/month					
Coupons	\$97.09	\$24.30	\$60.06	\$59.48	\$47.63
EBT	41.91	8.45	13.14	13.41	16.11
Cost/\$1000 of benefits Redeemed					
Coupons	\$5.84	\$20.00	\$42.77	\$69.74	\$12.93
EBT	2.86	7.90	12.20	25.96	4.69
EBT - Coupon Difference	-\$2.99	-\$12.09	-\$30.58	-\$43.78	-\$8.24
Percent Difference	-51.1%	-60.5%	-71.5%	-62.8%	-63.7%
Number of Stores					
Coupons	(19)	(60)	(18)	(20)	(117)
EBT	(18)	(48)	(19)	(15)	(100)

Source: Pre- and Late Demonstration Retailer Interviews.

Statistical significance: No EBT-coupon difference are statistically significant at the .10 level.

Note: Average cost/store/month was derived by multiplying handling time and wage for each store, then averaging by store type.

Cost per \$1,000 of benefits redeemed was derived by adding the handling cost estimates for every store reporting such a cost in each store type. This figure was then multiplied by 1000, and the result was divided by the total food stamp volume (EBT or coupon) for each type.

the scale economies are present in both coupon and EBT systems, however, the percentage savings are roughly similar for all store types.

Average costs per store amounted to about \$48 per month in the coupon system and \$16 in the EBT system. It must be recalled, however, that although these figures are the best estimates of actual costs incurred per store, they are not fully comparable. The coupon figures are based on Pre-Demonstration data, while the EBT figures come from the Late Demonstration period. The caseload in Reading declined somewhat in the interim, as did some of the stores' food stamp business. For all participating stores combined, Late Demonstration EBT volume was about a third less than Pre-Demonstration coupon volume. The average monthly cost figures thus provide a useful perspective on how much money is involved, but the costs per \$1000 in benefits redeemed provide the better comparison between systems.

RETAILER PERCEPTIONS OF HANDLING COSTS

The Late Demonstration interviews asked retailers whether they believed handling costs under the EBT system to be higher or lower than under the coupon system. Most (77 percent) believed that handling costs were about the same, with 7 percent saying that handling cost were somewhat higher, and 10 percent saying that these costs were somewhat or much lower.

Having estimated that handling costs are actually 64 percent lower under the EBT system, it is somewhat surprising that retailer perceptions do not reflect the reduction in cost. Part of the explanation doubtless lies in the small numbers involved: retailers might well consider a difference of less than \$30 per month to be "no effect". In addition, retailers may well have been remembering difficulties they encountered in reconciling EBT benefits. Although the reconciliation problems did not necessarily entail higher costs on a routine basis, they loomed large as a source of irritation. As Section 5.2 indicated, improvements to the reconciliation system were the most popular potential EBT modifications.

5.4 EBT EFFECTS ON TRAINING COSTS

New cashiers must learn the rules and procedures for accepting payment by food stamps. Most stores carry out some form of systematic training for this purpose. In addition, when the EBT system was introduced,

cashiers and other personnel in all of the participating stores were trained. This section presents the estimated costs for these activities.

TRAINING PROCEDURES

EBT Start-up Training. PRC conducted retailer training sessions in Reading in September 1984, instructing over 800 personnel from participating stores in the operation of the EBT system. The sessions, conducted at a central location in Reading, consisted of a system description, instructions on the proper use of the BTT to make purchases and refunds, and simulation exercises. (Because the EBT Center was not yet operational at the time the training sessions were conducted, the terminals used were not live. Instead, they were programmed in a "training mode" to demonstrate certain system functions.) Training gave only limited attention to how to handle problem transactions.

Not all participating retailers sent each cashier to a PRC training session. In some cases, only the owner/manager attended, and this individual trained other cashiers. Survey results show that 60 percent of the stores that sent a representative to the PRC training sessions provided their own training later to a total of 396 individuals. This training was generally shorter than the PRC sessions, averaging less than one-half hour.

Ongoing Training. Upon hiring a new cashier or other employee who will handle food stamp sales, retailers must instruct them on food stamp regulations and the proper procedures for handling food stamp coupons. As a part of their overall training, new employees often receive an FNS training pamphlet that describes eligible items and highlights program regulations. They are instructed to request identification from food stamp customers, to inspect the serial number on coupons in denominations greater than one dollar, and to give no more than ninety-nine cents in cash change. Also, cashiers are reminded to treat food stamp clients and cash customers equally.

Training a new cashier for the EBT system is, in the initial stages, similar to food stamp coupon training. For example, cashiers still must learn to distinguish eligible items from ineligible items, to scrutinize the identification card, and to afford equal treatment to all customers. In order to transact an EBT sale, however, a cashier must learn the following operations:

- executing the card swipe and verifying the PIN match;
- entering the purchase amount;
- responding to data messages, where applicable; and
- providing customer receipts.

By performing these operations, a cashier can transact a routine EBT purchase. Some situations, however, require either the presence of an owner/manager or additional cashier training. These are sign-ons, refunds, and manual sales. Sign-ons and refunds are no more complicated than other EBT operations. The most important difference is that they require the use of the store card and PIN, which an owner/manager keeps for control purposes. Manual sales, on the other hand, are somewhat more complex. To complete a manual sale, a cashier must:

- determine that the BTT or central EBT system is actually down;
- call the EBT Center for authorization;
- complete the manual sales form and obtain the client's signature; and
- retain the store copy for submission to the EBT Center.

Given the variety of operations that the EBT system can require of store personnel, it is not surprising that the level and intensity of training tends to vary substantially. In supermarkets, where managerial support is almost always available, cashiers may be trained to handle only routine EBT sales. Some smaller stores opt to provide cashiers with comprehensive system training to avoid confusion in extraordinary situations.

METHODOLOGY

The method of estimating training costs is essentially the same as that for handling costs. Interviews asked retailers about the number of people trained, the amount of time spent on training, and their wage rates.

~~Rate Demonstration rather than Price Demonstration data were used to estimate~~

The discussion above covered two types of training: start-up training as the EBT system was introduced, and training for new cashiers as they are hired. New cashier training occurs in both the coupon and EBT systems on an ongoing basis. Start-up training, in contrast, was a one-time event in the EBT system; presumably each store carried out an analogous general training in coupon procedures when the store began participating in the Food Stamp program, although no information is available about this start-up training in the coupon system. Because start-up training is a one-time cost to grocers, which would be amortized over the expected lifetime of the store (and which would therefore be extremely small as a cost per \$1000 in benefits redeemed), only the cost of ongoing training for new cashiers is included in our primary estimates of retailer participation costs.

ESTIMATED TRAINING COSTS

EBT Startup Training. Start-up training cost has two components: the cost of sending employees to the PRC training sessions, and the cost of follow-up training for any employees who did not attend the sessions. Both costs are estimated by multiplying the wage rates of the personnel involved by the duration of the training session.

On average, stores incurred about \$27 in start-up training costs. Costs differ sharply between supermarkets and other types of stores, because supermarkets have larger numbers of employees needing training. Start-up training costs for supermarkets are thus estimated at an average of \$78 per store, while the other three groups average between \$14 and \$23. (If training costs were calculated per \$1000 in benefits redeemed, the disparity would be reduced.)

Ongoing Training. Ongoing training is performed as stores hire new cashiers. Costs are therefore estimated by multiplying the number of new hires per month by training time and the relevant wage. The number of new hires tends to be the key cause of cost levels across stores: stores with many employees or high turnover have high training costs. Some stores, mainly small groceries, reported no new hires and hence have no estimated cost for ongoing training. Supermarkets and convenience stores report higher turnover rates than grocery stores and stores included in the "other" category, and thus show higher training costs.

METHODOLOGY

In principle, accounting errors can entail three kinds of costs for retailers: the value of permanent losses; the foregone interest on funds temporarily unavailable because of an error that is subsequently resolved; and the labor cost of identifying and resolving errors.

This analysis includes only the value of permanent losses. The foregone interest on errors resolved without loss is too small in any given store to be of interest. Labor costs are potentially important, but are included in the estimates for handling and reconciliation costs.

Data for estimating accounting error losses in the coupon system come from the Early Demonstration interviews. Late Demonstration interviews provide parallel information on losses in the EBT system.

ESTIMATED COST OF ACCOUNTING ERRORS

No retailers said they experienced permanent losses from accounting errors in the coupon system. Temporary miscrediting sometimes occurs, typically because either the store clerk or the bank teller counts the coupons incorrectly. These errors are small (often \$1) and quickly corrected. Because no permanent losses occur, however, the estimated cost is zero for all store types.

Permanent losses in the EBT system were episodic and not widespread, but the value of these losses when they were reported was sometimes substantial, particularly in grocery stores. Exhibit 5-15 lists accounting error cost components and comparisons. Across all stores, accounting losses amounted to 58 cents per \$1000 in EBT transactions, mainly concentrated in grocery stores.

RETAILER PERCEPTIONS OF ACCOUNTING ERROR LOSSES

Given the relatively low percentage of stores reporting accounting error costs (13 percent in the EBT system), it is not surprising that most retailers saw no difference in accounting error costs between the two systems. Ninety-one percent of retailers thought that accounting error costs were the same with EBT as with food stamp coupons. Supermarkets diverged from the general pattern, with 25 percent indicating that costs for accounting

Exhibit 5-15

Accounting Error Losses for Coupon and EBT Systems

	Major Store Type				Total
	Super-market	Grocery	Convenience	Other	
Number of stores reporting non-zero losses	(8)	(4)	(0)	(1)	(13)
Percentage of stores reporting any non-zero loss	57.0%	7.4%	0.0%	5.9%	12.5%
Average monthly value of permanent losses for stores with non-zero losses					
Coupons	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
EBT	13.65	26.91	0.00	2.43	16.87
Cost/store/month					
Coupons	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
EBT	7.80	1.99	0.00	0.14	2.11
Cost/\$1000 of benefits redeemed					
Coupons	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
EBT	0.24	1.72	0.00	0.27	0.58

Source: Pre- and Late Demonstration Retailer Interviews.

Statistical significance: No EBT-coupon differences are statistically significant at the .10 level.

Note: Cost/store/month and cost/\$1000 of benefits are calculated over all stores, including those with no losses.

Exhibit 5-14

Ongoing Training Costs for Coupon and EBT Systems

	Major Store Type				All Stores
	Super-market	Grocery	Convenience	Other	
Number of stores with non-zero costs, percent non-zero					
Coupons	(17) 89.5%	(12) 21.8%	(16) 84.2%	(5) 29.4%	(50) 45.4%
EBT	(18) 94.7%	(14) 25.4%	(16) 84.2%	(5) 29.4%	(53) 48.2%
Average new hires/store/month					
Coupons	2.90	0.23	2.22	0.13	1.77
EBT	2.79	0.18	2.22	0.12	1.68
Average training time (hrs)					
Coupons	0.98	0.54	0.51	0.45	0.67
EBT	0.73	0.82	1.21	0.88	0.91
Average cashier wage (\$/hr)					
Coupons	\$3.75	\$3.61	\$3.41	\$4.25	\$3.66
EBT	3.75	3.56	3.41	4.33	3.67
Average cost/store/month					
Coupons	\$7.40	\$0.06	\$2.88	\$0.05	\$1.68
EBT	6.17	0.09	17.76	0.16	4.20
Cost/\$1000 of benefits redeemed					
Coupons	\$0.41	\$0.05	\$1.89	\$0.07	\$0.43
EBT	0.44	0.08	16.49	0.30	1.29
EBT - Coupon Difference	\$0.03	\$0.03	\$14.60	\$0.23	\$0.86
Percent difference	7.3%	40.0%	772.5%	328.6%	200.0%

Source: Late Demonstration Retailer Interview.

Statistical significance: No EBT-coupon differences are statistically significant at the .10 level.

Note: Average cost/store/month was derived by multiplying new hires/month, EBT training time, and cashier usage for each store, then averaging by store type.

Average training time is roughly similar across store types, except that supermarkets report higher average coupon training costs and convenience stores report higher EBT training costs than other stores. These differences suggest reporting error, because we know of no corresponding differences in procedures. In the absence of a basis for adjusting the data, however, the reported data are used as received.

Training costs for the coupon system amount to 43 cents per \$1000 of benefits (Exhibit 5-14). The estimate for the EBT system is greater at \$1.29 per \$1000. The difference is not statistically significant, however.

Supermarkets and convenience stores have the highest average training costs per month because of their higher turnover rates. This translates into much higher costs per \$1000 in convenience stores because they have relatively low average food stamp volumes. Supermarkets' higher volumes make their training costs per \$1000 more comparable to those of other store types.

RETAILERS' PERCEPTIONS OF TRAINING COSTS

When asked about training costs, 90 percent of retailers surveyed said that training costs were about the same with the EBT system as with food stamp coupons. Eight percent said that these costs were "somewhat higher" with EBT, and two percent said that training costs were "somewhat lower with EBT." This suggests that training costs are not a visible component of operating costs--the maximum estimate is less than \$20 per month per store--and that retailers are not sensitive to fluctuations in these costs.

5.5 EBT EFFECTS ON LOSSES FROM ACCOUNTING ERRORS

Procedures for checkout, handling and reconciliation, and training are the major components of retailers' participation costs and the main sources of differences in participation costs between the coupon and EBT systems. Participation costs can also result from accounting errors, from delays between purchases and the corresponding credits to retailers' bank accounts, from the need to reshelve returned or unpurchased items, and from the space requirements of the EBT terminal. These four minor components of retailer participation cost are discussed in this and the next three sections. This section presents estimates of the costs related to accounting errors.

NATURE OF ACCOUNTING ERRORS AND THEIR RESOLUTION

Accounting errors can cause the amount credited to a retailer's bank account to differ from the actual value of food stamp sales. Disparities between store records and bank records are not uncommon, and most are resolved either by adjusting the credit or identifying a mistake in the records. Of primary interest here, however, are the errors that retailers believe cause actual losses--that is, situations in which they never receive full credit for the food stamp benefits they redeem.

Coupon System. Three types of accounting errors can occur with food stamp coupons. Coupons can be miscounted at the store, the Redemption Certificate can be filled out incorrectly, or the bank can credit the store's account incorrectly.

Resolution of food stamp coupon accounting errors is relatively simple. Should a store miscount coupon or complete the Redemption Certificate incorrectly, the bank will probably note the error. Should the bank make an error in crediting the retailer's account, the retailer will identify the problem upon reviewing the bank statement.

EBT System. Under the EBT system, managers consider accounting errors to occur if the store's account has been credited incorrectly or if the manager is unable to reconcile the account successfully for an extended period of time. Because store managers are unable to reconcile their EBT accounts daily (unless they make special arrangements to get deposit information), this can be accomplished only upon receipt of the monthly bank statement. Furthermore, should the store fail to sign off at bundle-up on any business day, the daily sign-off receipt may not match the entries on the statement.

Perceptions of EBT system accounting errors are directly related to the reconciliation process. If retailers are unable to reconcile the electronic food stamp transactions in a given month, they sometimes assume that an error has been made. Frequently, these errors can be rectified by information from the EBT Center or the bank statement. If several months pass without resolution of the problem, however, the retailer perceives that the loss is, or could be, permanent.

errors were higher in the EBT system. It is likely that these respondents were thinking of the difficulty they experienced in reconciliation, since none had reported actual permanent losses.

5.6 EBT EFFECTS ON FLOAT COSTS

Given the relatively high operating costs and low profit margins in the retail food industry, stores try to maximize the earning power of all assets, even in the short term. Float, a measure of lost earning power, is reduced when deposits of cash, checks, or food stamps are accelerated, and it is increased when these deposits are delayed. This section presents estimates of the retailers' float costs under the coupon and EBT system.

PROCEDURES CAUSING FLOAT

In the coupon system, float results from two factors: the amount of time between the food stamp sale and the coupon deposit, and the amount of time the bank takes to credit the deposit. Grocers intent upon reducing float deposit food stamp coupons daily and seek out banks that credit these deposits immediately. Retailers less concerned about the float (perhaps because food stamp volume is low) deposit less frequently and may not be concerned with a bank's crediting procedures.

The EBT system is designed to credit a store's account promptly. Sales made before 2:00 PM are normally credited the next banking day. Sales after 2:00 PM or anytime on weekends or holidays are credited the following business day. If the system is functioning as intended, a retailer can assume that crediting occurs promptly and that float is limited.

METHODOLOGY

In order to calculate the cost of float, it is necessary to determine the rate of interest that is foregone when deposits are delayed. In the first grocer interview, grocers were asked about their banking arrangements. As most stores indicated that they made deposits to some type of checking account, the foregone rate of interest is that being offered on demand deposits. Approximately 94 percent of retailers participating in the demonstration used three local banks in Reading; during the demonstration the

average rate of interest offered by these banks for demand deposits was 5.9 percent per annum.

The second component of the float cost calculation is the number of days from sale to crediting. For food stamp coupon deposits, it is necessary to ascertain the frequency of coupon deposits as well as the time required by the bank to credit the deposit. For example, in a store in which food stamp coupons are deposited weekly, the average length of time between sale and deposit is three days. If the bank takes an additional day to credit this deposit, the average total time from sale to crediting is four days. Information on deposit frequency and bank crediting time was gathered in the Pre-Demonstration interview.

Because the EBT system eliminates the need to make deposits, the length of time from sale to crediting is determined by the ability of the EBT center to bundle the daily sales and transmit these data through the Automated Clearing system. Retailers were asked in the Late Demonstration interviews how long this process appeared to take, and their responses are used in estimating EBT system float. The retailer estimates, averaging between 1 and 1.5 days, are consistent with system policies and normal operating patterns.

Float costs are calculated by multiplying the number of days from sale to crediting, the average daily food stamp volume, and the daily interest rate. Float costs for individual stores are then used to derive the aggregate measures, cost per store per month and cost per \$1000 in food stamp benefits redeemed.

ESTIMATED FLOAT COSTS

Float costs are not large in either the coupon or the EBT system, but they are lower with EBT. The average float cost with coupons is 29 cents per \$1000 in benefits redeemed. This cost drops to 5 cents in the EBT system (Exhibit 5-16). Although the reduction is large in percentage terms, the cost differences generally are not statistically significant.

Supermarkets had substantially lower coupon-related float costs than the other kinds of stores, because nearly all of the supermarkets deposited their coupons daily. Other kinds of stores deposited coupons less often--understandably, because their float costs (even with less frequent deposits)

Exhibit 5-16

Float Costs for Coupon and EBT Systems

	Major Store Type				Total
	Super-market	Grocery	Convenience	Other	
Average days from sales to Deposit					
Coupons	1.32	7.73	4.38	8.32	6.07
EBT	NA	NA	NA	NA	NA
Average days from deposit to credit					
Coupons	0.45	0.93	0.50	0.79	0.75
EBT	NA	NA	NA	NA	NA
Average total days from sale to credit					
Coupons	1.77	8.66	4.88	9.11	6.82
EBT	1.23	1.54	1.05	1.35	1.36
Cost/store/month					
Coupons	\$2.16	\$1.27	\$0.75	\$0.73	\$1.25
EBT	0.77	0.06	0.00	0.03	0.18
Cost/\$1000 of benefits redeemed					
Coupons	\$0.11	\$0.99	\$0.53	\$0.73	\$0.29
EBT	0.06	0.05	0.01	0.05	0.05
EBT - Coupon difference	\$-0.05	\$-0.94*	\$-0.52	\$-0.68*	\$-0.24
Percent difference	-45.5%	-95.0%	-98.1%	-92.3%	-82.8%

Source: Pre- and Late Demonstration Retailer Interviews.

Statistical significance: +, P < 0.10; *, P < 0.05; **, P < 0.01; ***, P < 0.005.

amounted to about \$1 per month per store. Because the EBT system gave all stores the same deposit pattern, reported EBT float costs are approximately equal across stores. The greatest savings therefore occurred for the stores that had been slowest in depositing their coupons.

RETAILER PERCEPTION OF FLOAT COSTS

Retailers' comparisons of float in the two systems vary somewhat from the analysis results. Not surprisingly, in view of the small amounts involved, 82 percent see no difference between the systems. Of those who report a difference, however, more say that float is higher with the EBT system than with coupons. It seems likely that these responses are another reflection of reconciliation problems, which led some grocers to feel that particular deposits had been delayed for some time.

5.7 EBT EFFECTS ON RESHELVING COSTS

A store can incur reshelving costs in two situations. The first is when customers return items to a store for exchange or refund, and the second is when customers bring items to the checkout and find they do not have enough funds to cover the intended purchase or decide they do not wish to purchase certain items.

The Early Demonstration interview asked grocers whether they accept returns. Approximately 29 percent accept no returned items, while another 38 percent do so only with a receipt. This tends to limit the effect of returned items on reshelving costs for the majority of retailers. Stores have no similar control over items brought to the checkout counter but not bought; this is the largest component of reshelving costs.

Neither the coupon system nor the EBT system would be expected to affect a store's normal procedures for dealing with returns and reshelving. It was hypothesized, however, that the payment system might affect the frequency with which food stamp recipients bring items to the counter but have insufficient benefits to pay for them. Accordingly, this section presents estimates of reshelving costs for the EBT and coupon systems.

METHODOLOGY

The method for estimating reshelving costs is basically similar to that for other labor-based costs, such as handling and reconciliation. Data for both the coupon system and the EBT system estimates come from the Late Demonstration interviews. Interview questions were reformulated after the Pre-Demonstration wave, in order to elicit better information from retailers. This meant that the Pre-Demonstration responses on coupon system costs were not comparable to the Late Demonstration data on EBT costs. For the coupon cost per store per month, the estimates were based on Late Demonstration data and were rescaled to correspond to the volume of coupon redemptions in the Pre-Demonstration period--i.e., the volume underlying the coupon estimates for other kinds of participation costs.

Costs are estimated by determining the average number of hours per week that store personnel spend reshelving items that food stamp recipients bring to the checkout counter, and multiplying this figure by the relevant wage rate(s).

ESTIMATED RESHELIVING COSTS

Reshelving costs are small for all kinds of stores under both systems, and essentially unchanged by the EBT system. Overall, reshelving costs amount to 46 cents per \$1000 of food stamp coupons accepted, and 44 cents for EBT transactions (Exhibit 5-17). None of the cost differences is statistically significant.

Retailers' interview responses are consistent with these estimates, indicating that reshelving costs are not a major concern. Asked which system caused higher reshelving costs, more than 90 percent say there is no difference.

5.8 EBT EFFECT ON SPACE COSTS

All of the participation cost elements examined thus far affect retailers in both the coupon and the EBT systems. The EBT system introduces a kind of participation cost that has no equivalent in the coupon system: the

Exhibit 5-17

Reshelving Costs for Coupon and EBT Systems

	Major Store Type				Total
	Super-market	Grocery	Convenience	Other	
Average reshelving time/month (hrs)					
Coupons	1.47	0.72	0.60	0.0	1.10
EBT	2.43	1.00	0.72	0.0	1.60
Average wage (\$/hr)					
Coupons	\$3.64	\$5.97	\$3.88	\$0.0	\$3.98
EBT	3.54	4.55	3.72	0.0	3.85
Average reshelving cost/month					
Coupons	\$5.83	\$4.29	\$2.60	\$0.0	\$4.71
EBT	8.59	4.12	2.85	0.0	6.07
Number and Percentage of stores reporting cost					
Coupons	(6)	(1)	(3)	(0)	(10)
	31.5%	1.8%	16.6%	0.0%	9.2%
EBT	(9)	(5)	(4)	(0)	(18)
	47.3%	9.2%	22.2%	0.0%	7.6%
Cost/store/month					
Coupons	\$1.84	\$0.08	\$0.43	\$0.00	\$0.43
EBT	4.07	0.38	0.63	0.00	\$1.01
Cost/\$1000 of benefits redeemed					
Coupons	\$0.43	\$0.57	\$1.03	\$0.00	\$0.46
EBT	0.42	0.41	1.05	0.00	0.44
EBT - Coupon Difference	\$-0.01	\$-0.06	\$0.12	\$0.0	\$-0.02
Percent difference	-0.02%	-0.11%	0.12%	0.00%	-0.04%

Source: Late Demonstration Retailer Interview.

Statistical significance: No EBT-coupon differences are statistically significant at the .10 level.

Note: Data used to derive reshelving cost estimates for both systems were collected in the Late Demonstration period when food stamp coupons comprised the smaller portion of all food stamp benefits redeemed. Hence, although the coupon costs per store are smaller than the EBT costs per store, the costs per \$1000 of redemptions are about equal.

cost of the space occupied by the terminals that might have been used for other purposes.

Although the actual dimensions of the equipment amounts to slightly more than one square foot, the space occupied depends on how the equipment is installed. There are almost as many different equipment configurations as stores in the demonstration. Some stores place BTTs on shelves or attach them to poles near the cash register. Printers often are located at the end of the checkout counter or underneath the counter, depending upon the amount of space available.

METHODOLOGY

The Late Demonstration interview asked retailers to estimate the amount of space occupied by EBT equipment. This figure was then multiplied by the cost of space per square foot. Because many supermarkets and convenience stores pay rent on a basis other than cost per square foot, and some grocery and other stores paid neither rent nor mortgage, it was necessary to generate independent estimates. Based on the responses of those grocers paying rent per square foot, values were imputed for all other stores. These values are \$1.75 per square foot for supermarkets, \$4.00 per square foot for convenience stores and 53 cents per square foot for grocery stores and other stores.

Although the retailer incurs no out-of-pocket expenditures for the space consumed by the EBT terminal, the estimation procedure described above implicitly assumes that all space has an opportunity cost--that is, the retailer would put the space to some other productive use. To test this assumption, the interview asked retailers how the space would be used if the EBT equipment were not there. Based on their responses, an adjusted space cost was estimated. Stores indicating no other use for the space were assumed to have no cost; stores indicating any alternative use were assigned the full cost computed under the first procedure.

ESTIMATED SPACE COSTS

The cost of space occupied by EBT terminals is estimated at about \$35 per month for supermarkets, which have multiple terminals, and \$1 to \$3 for other types of stores (Exhibit 5-18). This translates into an average cost of \$2.24 per \$1000 of benefits redeemed.

Exhibit 5-18

Space Costs for EBT Systems

	Major Store Type				Total
	Super-market	Grocery	Convenience	Other	
Cost/store/month	\$35.21	\$1.01	\$3.32	\$0.85	\$7.29
Adjusted cost/store/month ^a	\$0.0	\$0.36	\$2.40	\$0.59	\$0.68
Cost/\$1000 of benefits redeemed	\$2.52	\$0.88	\$3.09	\$1.69	\$2.24
Adjust Cost/\$1000 of benefits redeemed ^a	\$0.0	\$0.32	\$2.23	\$1.16	\$0.21
Number of Stores	(19)	(54)	(19)	(18)	(110)

^aAssumes zero cost in stores reporting no alternative use for space.

Source: Late Demonstration Interviews.

Adjusted costs, which were set at zero for stores reporting no alternative use of the EBT terminal space, are much lower, with an overall weighted average of 21 cents per \$1000. Surprisingly, no supermarkets indicate alternative uses of their EBT terminal space, apparently because the equipment is carefully located to avoid disrupting other activities. Convenience stores have the highest cost per square foot and also the highest incidence of respondents indicating alternative uses for the space (70 percent), and hence the highest adjusted space costs.

5.9 SUMMARY OF COSTS TO GROCERS OF COUPON AND EBT SYSTEMS

By adding checkout costs, handling and reconciliation costs, training costs, the costs of accounting errors and float, reshelving costs, and space costs, it is possible to compare the total costs of participation in the coupon and EBT systems. As noted in Sections 5.2 and 5.8, both checkout and space costs can be calculated in terms of full costs or more limited adjusted costs. Both calculations are presented in Exhibit 5-19, with estimates based on limited opportunity costs appearing in parentheses.

Based on the full-cost estimates, the EBT system reduces retailer participation costs by about one-fourth, from about \$18 to about \$13 per \$1000 in benefits redeemed (Exhibit 5-19). These costs translate into \$2.16 per case month in the coupon system and \$1.61 in the EBT system. On a per-transaction basis, coupon costs amount to \$.26 and EBT costs to \$.19.

Although these costs are small in absolute terms, they must be

Exhibit 5-19

Cost Summary, All Retailers
(Cost/\$1000 of Benefits Redeemed)

	Coupon System		EBT System	
Checkout costs ^a	\$3.63	(\$1.60)	\$3.93	(\$1.85)
Handling costs	12.93		4.69	
Training costs	0.43		1.29	
Accounting error costs	0.00		0.58	
Float costs	0.29		0.05	
Reshelving costs	0.46		0.44	
Space costs	<u>0.00</u>	<u> </u>	<u>2.24</u>	<u>(0.21)</u>
Total cost	\$17.74	\$15.71	\$13.22	\$9.11
Total cost for:				
Supermarkets	\$9.46	(\$8.67)	\$9.37	(\$5.78)
Grocery stores	22.83	(22.28)	16.06	(12.27)
Convenience stores	49.87	(47.80)	50.28	(37.00)

^aEstimates from Late Demonstration period.

Adjusted estimates assuming limited opportunity costs appear in parentheses.

Another perspective on the overall cost of food stamp transactions is provided by a study of the retailers' costs associated with manufacturers' coupons.¹ Costs ranged from five to twelve cents per coupon in the ten stores studied, with an average of about eight cents. The average number of coupons per transaction is not given precisely, but appears to be about 3.5. Thus the average incremental cost for purchases involving manufacturers' coupons is about \$.28, quite comparable to the incremental \$.26 estimated for transactions involving food stamp coupons.

Handling and reconciliation costs are the main source of the EBT savings over food stamp coupons. EBT handling and reconciliation costs are more than \$8 lower than coupon costs per \$1000 of benefits redeemed. This difference offsets the higher EBT costs seen in some areas, most notably space costs.

The pattern is similar but more pronounced in the adjusted cost estimates, in which some checkout and space costs are discounted because the resources have no alternative use. The additional advantage of the EBT system in these figures comes mainly from lower estimated space costs.

The reduction in participation costs effected by the EBT system is largest for grocery stores, due to a large saving in handling and reconciliation costs and no major areas of increased cost. Supermarkets have a comparatively small reduction in handling costs, and for convenience stores a large handling cost reduction is offset by substantial increases in training and checkout costs. Thus, the full cost estimates show practically no EBT/coupon difference for supermarkets and convenience stores. The adjusted estimates indicate lower EBT costs in all three store groups, however.

PERCEIVED IMPACT OF EBT ON BUSINESS

Most retailers saw little impact of the EBT system on financial aspects of their business -- sales, operating costs, and profitability. Those who felt the EBT system had some impact were divided about whether the effect was positive or negative, although positive opinions held a narrow lead.

¹Arthur Andersen & Co., Study of Cost of Handling Manufacturers' Coupons to Selected Food Retailers--Chains and Independents. Washington, D.C.: Arthur Andersen & Co., 1983.

Interviewers asked retailers about impacts on business in the Early Demonstration, Interim, and Late Demonstration surveys. The Early Demonstration interview asked about changes in business patterns since the beginning of EBT operations. The other two surveys asked about changes in the previous three months (the approximate interval between surveys). Responses for the group as a whole are displayed in Exhibit 5-20.

More than three-quarters of the respondents consistently say the EBT system had no effect on their profitability, total sales, or operating costs. The small perceived impact on overall profits is not unexpected. Food stamp business accounts for a very small percentage of most grocers' business, typically between 3 and 7 percent, and tends to be concentrated in the product lines with lower profitability. The EBT system would have to have a large effect on this small part of the business to make a difference in overall profitability.

Somewhat surprisingly, operating costs received the largest percentages of "no impact" responses -- despite the fact that some of the major advantages and disadvantages grocers cited for the EBT system concerned types of operating cost (handling cost, checkout productivity). In fact, although our estimates indicate a substantial percentage reduction in retailer participation costs, the effects amount to only a few dollars per month for the average store.

Retailers believe the EBT system affected the volume of their food stamp sales more than their profits or costs, although a strong majority still see no impact. The pattern is inconsistent, however. Respondents in two interview waves see the EBT system increasing their food stamp sales, but the opposite was true in the other interviews.

Retailers' responses suggest that the EBT system may cause some shift in food stamp customers' buying patterns, reducing their purchases in the smaller grocery stores and increasing them in convenience stores and supermarkets. In all three surveys, the grocery store group respondents stand alone in reporting more negative than positive EBT impacts on food stamp volume.

Redemption data largely support the retailers' perceptions, as illustrated in Exhibit 5-21. Of all food stamp benefits redeemed in central

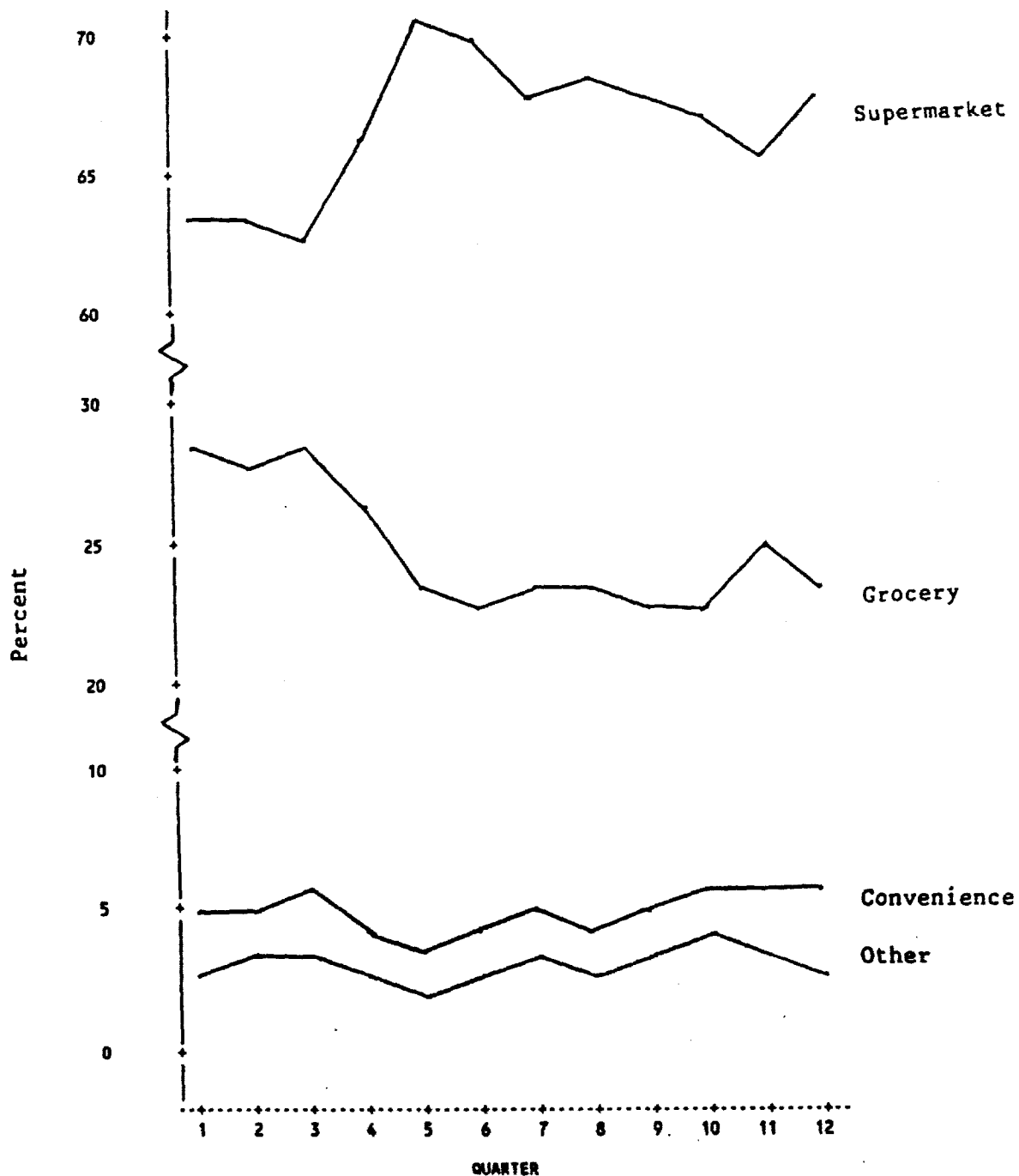
Exhibit 5-20

Retailers' Perceptions of EBT Impact on Business

Percent attributing changes to EBT in:	EBT-caused increases	No EBT- caused changes	EBT-caused decreases	Number of Stores
Profitability				
Early Demonstration	8.4%	86.7%	4.8%	(83)
Interim Demonstration	8.8	82.5	8.8	(80)
Late Demonstration	10.7	85.4	3.9	(103)
Total Sales				
Early Demonstration	10.6	78.8	10.6	(85)
Interim Demonstration	10.9	78.3	10.9	(92)
Late Demonstration	13.2	83.0	3.8	(106)
Food Stamp Sales				
Early Demonstration	23.3	62.8	14.0	(86)
Interim Demonstration	11.6	66.3	22.1	(95)
Late Demonstration	17.3	74.0	8.7	(104)
Operating Costs				
Early Demonstration	2.4	88.2	9.4	(85)
Interim Demonstration	7.0	90.7	2.3	(86)
Late Demonstration	0.0	99.0	1.0	(105)

Source: Early, Interim, Late Demonstration Interviews.

Percentage of Total Food Stamp
Redemptions by Store Type in Central Reading:
Quarterly 1984-1986



Source: FNS tapes containing monthly activity summaries by store.

^a Quarter 1 corresponds to January-March, 1984, ..., Quarter 12 corresponds to October-December, 1986.

Note: The demonstration began in Quarter 4.

Reading, an average of about 63 percent were redeemed in supermarkets during the nine months before the EBT system began operating.¹ The supermarket's share of redemptions climbed to about 70 percent over the next six months, and fluctuated between about 66 percent and 69 percent thereafter. Redemptions in grocery stores correspondingly fell from around 28 percent to a level averaging about 24 percent. No systematic change can be seen in the small proportion of redemptions in convenience and other stores.

Overall, however, the dominant theme in both the retailer responses and our participation cost estimates is that food stamps account for a very small part of store activity. EBT-caused reductions in food stamp participation costs are welcome, but have very little effect on the store as a whole.

5.10 GROCER WILLINGNESS TO BEAR ADDITIONAL EBT COSTS

Retailers consistently prefer the EBT system to coupons, as indicated in Section 5.1. When asked about the possible extension of the demonstration, 98 percent of retailers surveyed indicated that they would continue to participate.

If an EBT system costs the government more to administer than a coupon system, as Chapter 3 implies, the overwhelming retailer preference for the EBT system suggests that some type of cost-sharing arrangement might be appropriate. As might be expected, however, retailers have opposed the imposition of additional food stamp-related costs. Recent legislation prohibiting banks from charging fees for food stamp coupon deposits is evidence of retailers' determination to resist such charges.

To determine retailers' attitudes toward the concept of cost-sharing, a series of questions posing possible pricing options was asked in the Late Demonstration survey. Grocers were asked whether they would definitely participate, probably participate, probably not participate, or definitely not participate in the EBT system if they were asked to pay a portion of costs based on the following pricing options:

¹This analysis used data on total food stamp benefit redemptions, including both coupon and EBT redemptions. Because some of the stores outside central Reading had many non-demonstration customers, and therefore tended to accept substantial numbers of coupons during the demonstration period, the analysis was limited to those stores located in the same four ZIP code areas as the demonstration recipients.

- all costs related to telephone line installation and usage, but no other fees
- monthly rental fee for each set of BTTs, PIN-pads, and printers:
 - \$50 per month
 - \$100 per month
- transaction fee for each purchase:
 - \$.10 cents per transaction
 - \$.25 cents per transaction
 - \$.50 cents per transaction
- transaction fee based on the purchase amount:
 - 2 percent of the purchase amount
 - 5 percent of the purchase amount

The pricing options were chosen to reflect the range of mechanisms currently used in commercial credit and debit card systems. No "standard" fee arrangements yet exist in the industry; indeed, as Chapter 8 indicates, merchants pay fees in some point-of-sale systems, receive fees in others, and in some systems do neither. The fees indicated above would range in value from less than 1 to about 5 percent of redemptions in the average store, but could vary much more for particular stores in particular fee structures (for example, a \$100 monthly fee would be 20 percent in a store redeeming only \$500 in benefits).

Most retailers said they would not participate in any cost-sharing arrangement other than bearing their telephone costs (which were generally very limited). Exhibit 5-22 shows the responses. It cannot be taken for granted, however, that retailers' responses to the interview will accurately forecast their behavior. The virtually universal sign-up rate at the start of the EBT demonstration, despite uncertainties about how it would work, suggests that retailers may act against their preferences in order to retain their food stamp customers.

The analysis of participation costs suggests that retailers do not have much to gain financially from the EBT system as compared to the coupon system. The overall difference in participation costs amounted to an EBT-related gain of about \$4.50 per \$1000 redeemed. A fee of about six cents per transaction, or 0.45 percent of the purchase amount, would approximately offset the estimated cost difference. Because all of the cost-sharing

Exhibit 5-22

Overall Response to Cost-Sharing (Percent)

	Definitely	Probably	Probably Not	Definitely Not
Telephone costs	16.7	41.7	5.2	36.5
\$50 Rental fee	3.0	17.1	15.2	64.7
\$100 Rental fee	1.0	2.0	8.0	89.0
\$0.10 Fee/transaction	3.0	29.0	11.0	57.0
\$0.25 Fee/transaction	0.0	3.0	16.0	81.0
\$0.50 Fee/transaction	0.0	2.0	3.0	95.0
2% Fee/transaction	4.0	16.0	9.0	70.9
5% Fee/transaction	2.0	5.0	12.0	81.0

Source: Late Demonstration Interview.

questions asked about higher fee rates than these, it is reasonable that retailers gave generally negative responses, and that the least unpopular fee option was the fee of ten cents per transaction, which comes closest to the estimated difference.

The option meeting the least resistance was the payment of telephone charges only. It appears that grocers are more willing to assume the cost of maintaining a telephone line, plus a one-time installation charge if necessary, than to pay continually for an EBT system in the form of rental fees, fixed per-transaction fees or percentages of sales.

A fee of six cents per transaction, reflecting the difference in grocer participation costs, would compensate for only a part of the administrative cost difference between the coupon system and the EBT system. Assuming the average household makes 8 purchases per month, the fee would amount to 48 cents per case month. The EBT system's incremental administrative cost, as estimated in Chapter 3, was about \$24 per case month during the demonstration and ranges from about \$1.70 to \$6.90 in the partial piggy-back and independent system scenarios. Thus, retailer fees could not offset the EBT system's higher administrative cost without increasing the retailers' participation costs beyond their level in the coupon system.

5.11 CONCLUSIONS

Despite some initial skepticism about the feasibility of an electronic funds transfer system for the Food Stamp Program, most retailers in Reading accepted the concept of EBT. Upon learning of the demonstration, most authorized retailers wanted to participate, and the rate of participation remained high throughout. Although retailers identified flaws in the demonstration system, they consistently preferred the EBT system to the coupon system. Responding to interviews late in the demonstration, retailers in all major store groups preferred EBT to the coupon system by margins of more than three to one. By mid-1985, retailers were among the most active proponents of the EBT system and lobbied aggressively for the continuation of the demonstration.

Given this enthusiasm, the estimates of retailers' participation costs revealed surprisingly small advantages to retailers for the EBT system. Estimates of full costs were about \$18 per \$1000 of benefits redeemed in

the coupon system, and \$13 in the EBT system. The percentage difference is substantial, but the absolute dollars would scarcely be noticed in most stores. Based on average food stamp redemptions per month, participation costs for the typical store would amount to \$55 per month in the coupon system, compared with \$41 with EBT, a difference of \$14. This appears to be the perspective grocers took when they were asked directly about the impact of the EBT system on their overall costs and profitability; more than 80 percent saw no difference between the EBT and coupon systems, and the remainder were divided about the direction of the effect.

The analysis revealed substantial differences in participation costs for different kinds of stores. Supermarkets have the lowest costs, less than \$10 per \$1000 in food stamps in both systems. Convenience stores have the highest costs, around \$50 per \$1000 redeemed. The differences result mainly from differences in the number of food stamp purchases per month and the average size of food stamp purchases, both of which are much larger in supermarkets than elsewhere.

The analysis suggests that the EBT system causes the largest reduction in participation cost for grocery stores (about \$7 per \$1000 redeemed). Ironically, this group expressed the lowest rate of preference for the EBT system. Several factors may underlie this paradoxical pattern. One is general industry attitudes toward electronic point-of-sale systems: supermarkets and convenience stores are believed to have much to gain from such systems and have been among the early participants; smaller retailers are expected to be slower to participate. The EBT system's lower popularity in grocery stores may also stem from the variety of store-specific payment procedures that exist in specialty establishments (fruit stands, meat markets, etc.), as some of these retailers may find it difficult or irksome to adapt to the EBT transaction routine. Finally, the differing responses may reflect the different experience of the respondents: respondents in the smaller stores were typically owner/managers who often ring up sales themselves, while supermarket respondents were mainly managers who did not routinely operate the EBT equipment.

It is difficult to reconcile the retailers' enthusiasm for EBT with the limited financial effects, but four factors seem to be at work:

- Hassle--Interviews suggest that retailers consider the paperwork and other aspects of food stamp sales irritating given their dollar value. They see the EBT system reducing the irritation.
- Sales--Some retailers believe the EBT system increased their sales, and most believe it caused recipients to spend more of their benefits on food. By eliminating cash change for food stamp purchases, and perhaps by curtailing trafficking, the EBT system may actually have increased retailers' revenues from recipients.
- Fraud and abuse--Retailers clearly value the reductions in fraud and abuse that they believe the EBT system causes. Although some of this reaction may be linked to the sales issue above, some relates to a feeling that fraud and abuse reflect badly on the retailers.
- Future expectations--Some grocers discounted problems with the EBT system, expecting long-term improvements that they cannot hope for in the coupon system. Moreover, some expect electronic point-of-sale payment systems to become more broadly used in the retail food industry, and see the EBT system as a step in that direction.

Whatever the reasons, the Reading experience suggests that food retailers are likely to be a source of support for future EBT applications, at least in the absence of requirements for substantial cost sharing. The demonstration EBT system apparently reduced participation costs, but retailer enthusiasm far exceeds the EBT system's financial advantages. If future systems can offer greater financial advantages, particularly in reduced checkout and reconciliation time, even greater support could be expected.

Chapter Six

EFFECTS OF THE EBT SYSTEM ON FOOD STAMP RECIPIENTS

Food stamp recipients, the people the program is intended to serve, must be considered in assessing any prospective change in program operations. A change that makes it impossible for many households to participate will simply be ruled infeasible. A change that makes participation more inconvenient or costly is to be avoided, if possible.

The introduction of the EBT system raised two fundamental questions. Would all recipients be able to cope with the system, or would some stop participating in the program? Even if everyone could cope, would the system cause hardships or increase the cost or difficulty of participating?

Two issues caused particular concern. First, the EBT system represented a much more sophisticated financial system than most recipients were accustomed to using. Groups such as the elderly, the poorly educated, and the non-English speaking might be intimidated or simply unable to operate the system successfully. Recipients might have trouble keeping track of their remaining food stamp balance, and thus might run out of benefits early in the month and be unable to buy food later. Second, some food retailers might be unable or unwilling to participate in the EBT system. This could limit recipients' ability to use their food stamp benefits. If many small "corner groceries" dropped out of the program, recipients might have to travel further to shop, possibly at more expensive stores.

Some people expected the EBT system to have positive effects on recipients. For example, the EBT system would eliminate the recipient's monthly trip to the bank to exchange the ATP for coupons. It might also be more secure, reducing the chances of loss and theft of ATPs and coupons.

RESEARCH STRATEGY

This chapter addresses three major questions:

- How do recipients respond to the EBT system?

- Do they prefer the EBT or the ATP/coupon system?
- What do they like and dislike about the EBT system?
- What problems do they encounter in dealing with the EBT system?
- How do recipients' time and money costs of participating in the Food Stamp Program differ between the EBT and ATP/coupon systems? Participation costs include:
 - costs of obtaining benefits (getting the EBT card, exchanging the ATP for coupons, etc.);
 - costs of lost or delayed benefits; and
 - costs of dealing with issuance-related problems.
- Do difficulties with the EBT system cause some recipients to stop participating in the Food Stamp Program when they would otherwise have continued receiving benefits?

Most of the analysis in this chapter is based on surveys of food stamp recipients. Three rounds of interviews were conducted with households who received food stamp benefits, one round prior to the start of the demonstration and two rounds during the demonstration.¹ We refer to these as the Pre-Demonstration, Early, and Late Demonstration Surveys, respectively. We interviewed a sample of food stamp recipients who used the EBT system (EBT Demonstration group) and a comparison group of recipients who continued to use food stamp coupons (ATP Comparison group). Recipients were not randomly assigned to demonstration and comparison groups. However, as we show in Appendix VI-D (p. VI-28), there were no significant differences in the composition of the two groups, and therefore, our results will not be biased by the non-random assignment.

The research design allows two comparisons: a pre/post comparison for recipients living in the demonstration area, and a comparison of these demonstration recipients with the comparison group. Used together, the two comparisons allow us to distinguish effects of the EBT system from other changes that occurred over time and from differences in the composition of the demonstration and comparison groups.

¹Appendix VI-A (pp. VI-3-11) contains a detailed discussion of the survey of food stamp recipients, which we call the active case survey, including a definition of the demonstration and comparison samples, and a discussion of the response rates in the various rounds of interviews. The appendix also contains a discussion of two supplemental data sources used in the analysis.

HIGHLIGHTS

Reading food stamp recipients adapted relatively easily to the new system. The majority preferred EBT to the ATP/coupon system, even in groups such as the elderly and the non-English speaking. Recipients generally found the EBT system easier to use than the ATP/coupon system. No evidence indicated that the EBT system discouraged any recipients from participating in the Food Stamp Program.

Recipients reported spending less time and money dealing with the new system than the old. Participation costs are estimated at about \$1 per case month with EBT, compared with \$5 in the ATP/coupon system. Most of the difference comes from eliminating the recipient's monthly trip to the bank to exchange the ATP for coupons.

6.1 FOOD STAMP RECIPIENTS' RESPONSES TO THE EBT SYSTEM

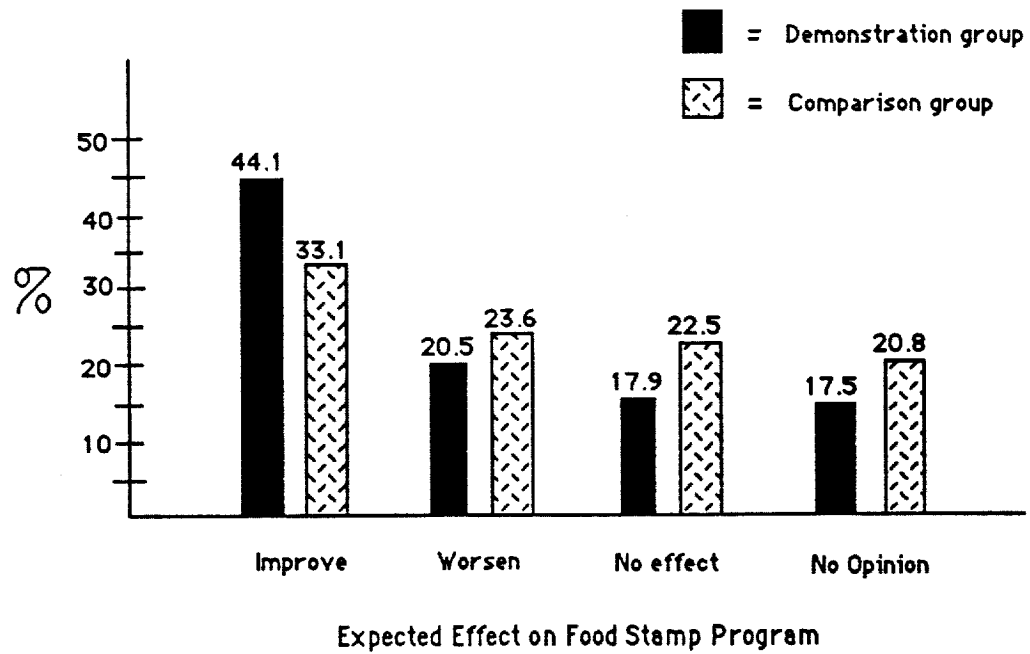
The interview data allow us to examine recipients' overall response to the EBT system at three times, once before the demonstration began and twice during the demonstration. Prior to the start of the demonstration, recipients were asked what they expected the EBT system would be like. Once the demonstration system was actually operating, they reported how satisfied they were with the EBT system and whether, in general, they found it preferable to the coupon system.

GENERAL EXPECTATIONS

The Pre-Demonstration survey asked respondents whether they had heard about the demonstration, and if so, whether they expected the EBT system would make the Food Stamp Program better or worse. Exhibit 6-1 presents their responses. Overall, recipients had generally positive expectations about the EBT system. Over 40 percent of those in the demonstration group expected the EBT system would make the Food Stamp Program better. The comparison group expressed somewhat less positive views: only one-third of the respondents expected the EBT system would make the program better.

Exhibit 6-1

Expectations About EBT System Prior to Start of Demonstration



Source: Pre-Demonstration active case survey

The less positive evaluation by the comparison group probably occurs because they were less informed about the EBT system than the demonstration group. The Berks County Assistance Office had briefed most demonstration recipients about the EBT system and how it would change the way they received and used their food stamp benefits, and emphasized the ways in which it would be easier to use than the coupon system and how it would reduce the level of fraud associated with coupon systems. The comparison group, in contrast, heard about the changes by chance, mainly through word-of-mouth. This suggests that recipients' initial reactions to an electronic funds transfer system may not be particularly positive, but that with appropriate information, their reception to the new system will be warm.

One concern about the EBT system was that some demographic groups might have a particularly difficult time adapting to the new system. These groups might therefore have negative expectations concerning the new system.

Analysis shows, however, that the only notable differences in expectations occurred among racial groups and between food stamp recipients receiving public assistance and others. Black respondents had less positive expectations than whites or other racial groups. Public assistance recipients had lower expectations than those not receiving public assistance.¹ However, their reasons for expecting the EBT system to be worse than the coupon system are no different from the reasons given by their counterparts. The explanation for the patterns is uncertain, and holds even controlling for race (or receipt of public assistance). It is possible, for instance, that the public assistance recipients were longer-term participants in the welfare system and more skeptical about the impact of changes. The elderly, the handicapped, and the non-English speaking did not have lower expectations than the population in general.

Benefits Expected From EBT. Respondents cited several reasons for expecting the EBT system to be better than the coupon system.² The factor cited most often was that the EBT system would stop abuse of benefits, particularly by making it difficult for recipients to sell their benefits for

¹Appendix VI-B, Exhibit VI-B1 (p. VI-13) contains these data.

²Appendix VI-B, Exhibit VI-B2 (p. VI-14) presents these tabulations.

cash. Respondents also expected less loss and theft with the EBT system compared with the coupons. This was one of the advantages stressed by the B CAO. Some respondents felt that using the EBT system would be better because it would require fewer trips to the bank, would be easier, and would make shopping quicker by reducing the time spent in the checkout line.

Problems Expected With EBT. Nearly one-third of respondents who expected the EBT system to be worse than the coupon system were afraid that the EBT system would limit their choice of stores.¹ In particular, they thought that small stores might not participate in the new system and thus it would be hard to use their food stamp benefits. This was a reasonable concern, as it was unclear before the demonstration started exactly how many stores would participate.

Another third of the respondents felt the EBT system would be more confusing than the coupon system, partly because it would be difficult to keep track of their balance. The respondents who thought the EBT system would be confusing tended to be elderly, Hispanic, and non-English speakers. Some also thought it would be less convenient and more trouble than using coupons. These expectations are more likely based on the uncertainty associated with the new system than any definite knowledge concerning how the EBT system would actually work. Nevertheless, they do resemble the general concerns raised in the planning process by client advocates and program administrators.

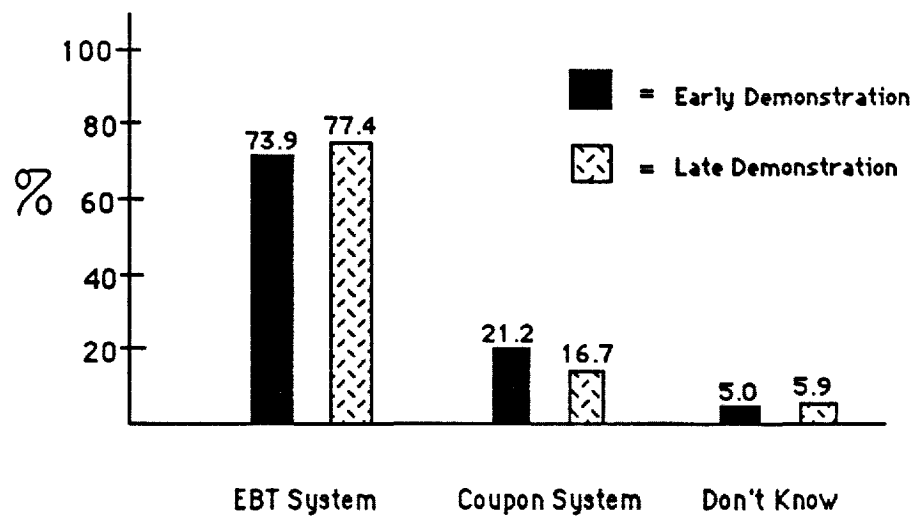
OPINIONS DURING THE DEMONSTRATION

Once the demonstration began, demonstration group recipients found the EBT system preferable to the ATP/coupon system, as Exhibit 6-2 shows. Asked whether they preferred the EBT or the ATP/coupon system, approximately three-fourths of the respondents who had used both systems said they preferred the EBT system. This is a substantial increase from the 40 percent who earlier expected the EBT system to make the Food Stamp Program better.

The match between recipients' expectations prior to the demonstration and their actual preferences after using both systems was far from perfect. About half of those who expected the EBT system would make the Food

¹Appendix VI-B, Exhibit VI-B3 (p. VI-15) presents these tabulations.

Exhibit 6-2
Overall Preference of Demonstration Participants^a



^a Only those who had used both the EBT and coupon systems were asked this question

Source: Early and Late demonstration active case surveys, demonstration group

Stamp Program worse ended up preferring the card to the coupon. In addition, about 10 percent of those who expected the EBT system to be an improvement found that they preferred the coupon system to the EBT system.

Recipients' overall opinions changed little over the course of the demonstration, as Exhibit 6-2 shows, perhaps growing slightly more positive. The group preferring EBT grew by a few percentage points, with corresponding shrinkage in the preference for coupons. The EBT system was preferred by a margin of more than four to one in the Late Demonstration interviews.

Reasons for Preference. Demonstration participants who preferred the EBT system cited a number of factors that made the EBT system easier to use than the ATP/coupon system.¹ Most found the EBT system quicker, easier, or more convenient than coupons at the checkout counter. Many respondents felt there was less chance that their benefits would be lost or stolen using the EBT system. Recipients also preferred the EBT system because they saved time by not having to go to the bank.

The reasons people actually preferred the EBT system differed from their expectations. Initially, people focused on how the EBT system would reduce abuse, theft, and loss of food stamp benefits. Experience showed that the EBT system was easier to use than coupons, and this became the recipients' main reason for preferring the EBT system.

Almost half of the demonstration participants who preferred coupons found them easier and more convenient to use at the checkout counter than the EBT system. This is the same reason others cited for preferring the EBT system, suggesting that different recipients simply found different systems easier to use. Respondents in the Late Demonstration period were much less concerned than the Pre-Demonstration respondents that the EBT system would limit their choice of stores, given that virtually all stores participated in the demonstration. Recipients also liked the coupon system because they were familiar with it. They found it easier to keep track of their balance as they could simply count the remaining coupons.

Preferences By Demographic Group. As discussed above, prior to the EBT demonstration, blacks and public assistance recipients were more skeptical

¹See Appendix VI-B, Exhibit VI-B4 (p. VI-16) for these data.

about the EBT system than the population in general. We examined how these groups felt once the EBT system was installed and whether there were any differences in preferences among other demographic groups.

Near the beginning of the demonstration, there were some differences in the preferences of various demographic groups. Blacks, public assistance recipients, handicapped persons, and those over 50 all preferred the ATP/coupon system to a greater extent than did their counterparts.¹ Nonetheless, a majority of all groups preferred EBT.

By the Late Demonstration period, however, most of these differences among groups were smaller, with at least 70 percent of the respondents in every group preferring the EBT system. Some differences were even reversed. For example, handicapped persons had a much higher preference for the EBT system than did non-handicapped persons and older persons preferred it more than younger persons.

The differences among racial groups declined, but were not eliminated. The differences between public assistance recipients and others remained constant. However, in both cases, the differences observed during the demonstration were considerably less than the differences in expectations prior to the demonstration.² It is interesting to note that the match between the expectations and actual preferences of blacks and public assistance recipients was far from perfect. Approximately half of those who thought the EBT system would make the Food Stamp Program worse ended up preferring the card to the coupon system.

Several factors may help explain the decline in the differences among demographic groups. The functioning of the EBT system improved over time, which would improve the outlook of people who had been affected by the problems. Some groups may simply have taken longer than others to adapt to the new system. To test this possibility, we compared the preferences of those recipients who had used the EBT system for less than six months and

¹Appendix VI-B, Exhibit VI-B5 (p. VI-17) presents these data.

²One hypothesis for the observed differences is that households that rely on children to do the shopping may find the coupon system easier than the EBT system. There is, however, no support for this hypothesis in the survey data. Preferences do not differ depending who does the shopping, even when controlling for receipt of public assistance.

those who had used it for six months or more. Blacks and public assistance recipients who were relatively new to the EBT system preferred the old coupon system more than did those who had used the system for six months or more. In addition, the new households were somewhat disproportionately black and public assistance recipients. However, this analysis is, at best, suggestive, as there were only 24 recipients who had used the system for less than 6 months, and thus the estimates are subject to errors. Overall, however, the data indicate that all groups had adapted well to the new system within a year.

6.2 RECIPIENTS' EXPERIENCES IN OPERATING THE EBT SYSTEM

Using the EBT system required food stamp recipients to change the way they received their benefits, kept track of their benefits, and did their shopping. This section describes the changes recipients had to make and the problems they encountered in using the EBT system. The analysis focuses mainly on the demonstration group; when relevant, it also compares the experiences of the EBT system users with those of the coupon users.

LEARNING THE SYSTEM

To avoid delays and bottlenecks in issuing the new photo identification cards, the Berks County Assistance Office (BCAO) began issuing the cards in April, 1984 to present food stamp recipients who would be participating in the demonstration, six months before the demonstration began. The BCAO also provided recipients with information concerning the demonstration.

Pennsylvania Department of Public Welfare employees trained demonstration participants on the use of the system in three waves, during October and November, 1984 and January, 1985. Participants in the January training session were primarily those with special needs, including Spanish-speaking persons and those with physical, emotional, or mental handicaps. Beginning in February 1985, BCAO employees assumed the training responsibilities for new recipients and held sessions two mornings a week.

Training sessions lasted approximately one hour, and 15 to 30 recipients participated in each session. The material presented included a general introduction to the EBT demonstration and a videotape with information on the EBT system, including PIN selection, balance checking, card care, how to purchase groceries, and a promotion of the system's benefits.

Participants also selected their Personal Identification Number, needed to use the EBT card. A clerk encoded the participants' cards so they could be used. During the last 15 to 20 minutes of the training session recipients practiced entering their PIN and obtaining their food stamp account balances.

Participants also received written information on how to use the card, how to protect the card, and how to use the EBT receipts to keep track of their account balance. The information packet contained a flyer for their children explaining how they could shop using the EBT card and the Alternate Shopper Card.

Recipient Assessment of Training. The surveys asked respondents how satisfied they were with the EBT training they received. Approximately 70 percent reported that they were very satisfied with the training. Only about 5 percent reported dissatisfaction. When asked what elements were missing from the training session, over 90 percent of the respondents said that nothing was missing. There was no clear pattern of systematic gaps in training reported by recipients. The responses in the two surveys were similar, indicating that recipients trained early in the demonstration were as satisfied as those trained later on.

Recipients' positive assessment of their training corresponded with the opinions of observers, who considered the sessions quite thorough and effective. Early survey responses from retailers indicated very few recipient problems, also suggesting that the training was successful.

Spanish-speaking participants were a bit less satisfied than English-speaking participants, although special sessions were held in Spanish. In the Early Demonstration survey, 71 percent of those who spoke English reported that they were very satisfied with their training, compared with 62 percent of the Spanish speakers. However, in response to the Late Demonstration survey, Spanish speakers were more satisfied with their training, with 79 percent reporting they were very satisfied. Although no major changes were made in training procedures, most of the later respondents were new entrants to the program, and were trained after the initial sessions. The later sessions often had fewer people than those during the start-up period and may have been easier for Spanish speakers for that reason.

REMEMBERING THE PERSONAL IDENTIFICATION NUMBER

The purpose of the PIN is to prevent unauthorized persons from obtaining food stamp benefits using the EBT card. The PIN is a 4-character code the recipient selects at the time the benefit card is issued; it is encoded (in altered form) on the card's magnetic strip.

At the checkout counter, the cashier passes the benefit card through a card reader. The shopper keys in the PIN number, and the terminal checks for a match with the encoded number. Recipients get three consecutive tries to enter a correct PIN; a purchase cannot be completed unless the PIN is correct. Recipients must also use their PIN to get information on their food stamp account balance.

Remembering the PIN was a new requirement for EBT recipients as the ATP/coupon system has no comparable step. Moreover, the PIN requirement has been hotly debated in the context of electronic point-of-sale systems, with some system designers and retailers arguing that the PIN intimidates customers and prevents them from using the system. Whether or not EBT recipients would be able to remember their PINs was, therefore, a matter of substantial concern.

As it turned out, the recipients did not consider the PIN to be a problem. Only about 7 percent of the respondents, in both surveys, reported ever forgetting their PIN. Most of these said they forgot 2 or 3 times. Only one participant reported having to get a new PIN as a result of forgetting the number. The training on the use of the PIN was undoubtedly partly responsible for the low incidence of problems.

Other data sources generally corroborate these responses. Checkout observations found one or more unsuccessful PIN entries in 3.6 percent of the transactions. Retailers reported that recipients had few problems using the PIN. System records indicate that instances in which a recipient made three unsuccessful attempts to enter a PIN occurred in only 0.2 percent of all transactions. These data imply that recipients who entered an incorrect PIN usually got it right on the second or third try.

MAKING THE PURCHASE

Buying food with food stamp benefits is much different under the EBT and coupon systems. Recipients can pay with coupons almost as if they were cash, the main distinction being the need to tear coupons out of books. To use the EBT system, recipients hand the EBT card to the cashier, who passes it through the card reader. The recipient then keys in the PIN. After the cashier transmits the purchase amount, the recipient checks the receipt to make sure that the right amount has been deducted from the food stamp account, and keeps the receipt as a record of how much is left in the account.

Expected Shopping Difficulty. The Pre-Demonstration survey asked respondents whether they expected shopping with the EBT system would be easier, harder, or the same as using the coupon system. Exhibit 6-3 shows that almost 30 percent thought it would be easier, another 30 percent thought it would be harder, and the rest expected there would be no difference. These expectations were substantially less positive than expectations concerning how the EBT system would affect the Food Stamp Program overall.

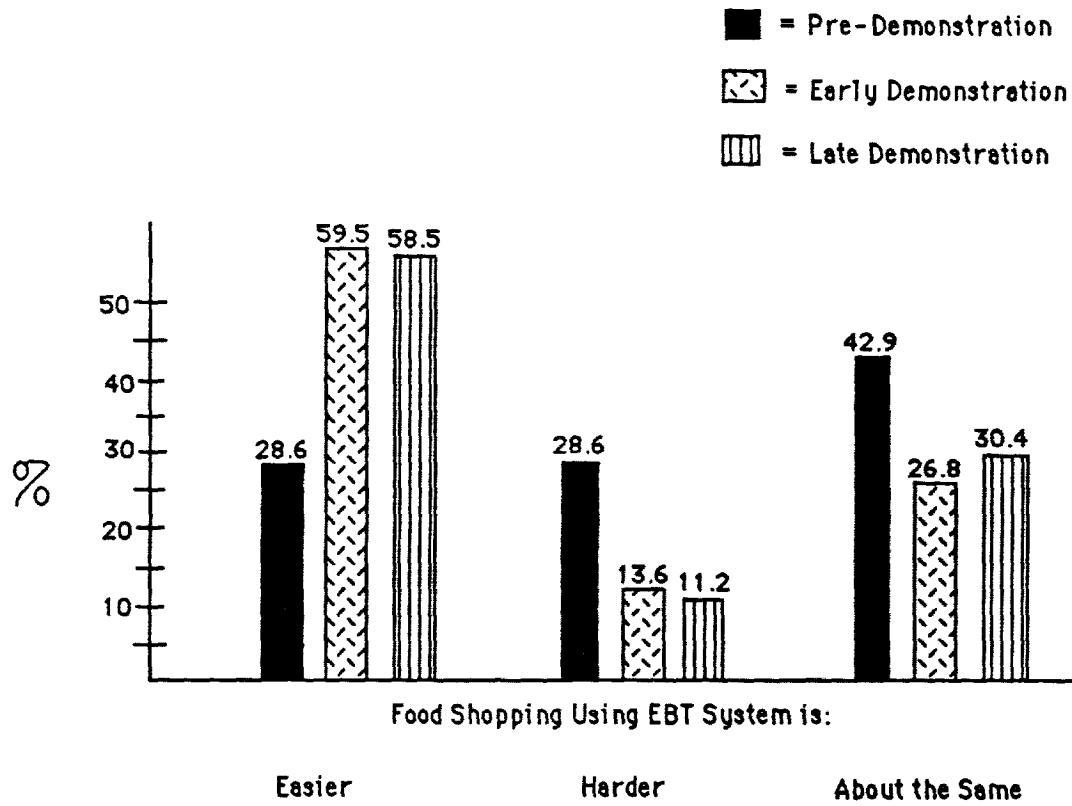
Participants' expectations about shopping differed slightly by demographic characteristics. Non-English speaking recipients, the disabled, women, and blacks had less positive expectations about shopping using the EBT system than did other groups. However, the differences were generally small and rarely statistically significant, suggesting that no particular group had pre-set negative expectations.

Respondents who expected food shopping to be easier under the EBT system most often said it was because the card itself would be easier or faster to use than coupons. Those who said shopping would be more difficult thought the EBT system would be confusing and slower at the checkout counter, and that it would be difficult to keep track of account balances, or harder to send someone else to do the shopping.

Later Perceptions of Shopping Difficulty. Once the demonstration began, participants found the EBT system much easier to use than they expected. Approximately 60 percent of the respondents in both surveys found that food shopping was easier with the EBT system than with coupons. This compares with only 30 percent who anticipated the EBT system would be easier. Only a small proportion actually considered shopping more difficult with the EBT system than coupons.

Exhibit 6-3

Ease of Food Shopping Under EBT and Coupon Systems



^a Numbers represent expectations of demonstration participants.
Expectations of comparison group were similar

Source: Pre-, Early, and Late Demonstration active case surveys,
demonstration group

Some of the demographic groups that expected shopping to be harder with the EBT system seem to have had problems in the early months, but then adjusted to the new system.¹ Persons with reported disabilities, females, and those over fifty years old found shopping more difficult with the EBT system than did those without disabilities, males, and those under 50 years of age, in the Early Demonstration period. In the later survey, however, none of these groups found EBT shopping harder than the average for all recipients. Only public assistance recipients consistently found the coupon system easier than the EBT system. At least half of the recipients in all groups found shopping easier with the EBT system than the ATP/coupon system in the Late Demonstration period.

It is somewhat surprising that recipients found the EBT process so easy, especially in light of the initial concerns about this population's lack of exposure to sophisticated financial systems. Upon closer examination, it appears that successful completion of an EBT food purchase demands less of the recipient than a coupon purchase. For a coupon purchase, the recipient must select the appropriate combination of coupon books and individual coupons to make up the purchase amount, and in most cases, tear coupons from a book. In contrast, a normal EBT purchase only requires the recipient to hand over the card and key in a four-character code. Particularly for recipients with limited language or arithmetic skills -- the very groups for whom initial concerns were raised -- the EBT system could be far easier.

Perceptions of System Failures. The surveys asked respondents about problems due to breakdowns in the EBT computer system. Approximately one-third of the Early Demonstration participants reported that they were unable to use their card because the EBT system was not working. On average, they experienced this problem twice between October 1984 and February-March 1985. Cashiers could call the EBT Center to get authorization to process transactions manually when the equipment was not working. However, the recipients reported that the clerk's typical response was to wait a few minutes and try the electronic transaction again. The recipients felt strongly about the system failures, with 40 percent of those experiencing failures calling them a "big problem".

¹See Appendix VI-B, Exhibit VI-B6 (p. VI-18) for these data.

Participants experienced somewhat fewer problems with the computer system in the Late Demonstration period. Approximately 25 percent reported being unable to use their card due to equipment failure. This occurred twice, on average. However, 40 percent said they experienced some problems because the computer system was working slowly. Recipients experienced slowdowns an average of three times.

Recipients were also asked whether the grocery store had ever deducted too much from their account, an event that could occur if the cashier keyed in the incorrect amount. Almost no one reported this problem. Similarly, few reported being charged for groceries they did not purchase.

KEEPING TRACK OF ACCOUNT BALANCES

The EBT Center maintains all recipient account balances, and users have three ways to get balance information. Whenever recipients make food stamp purchases, their account balance is printed on their EBT receipt. Recipients can also use the terminals in the store to check their balances, and some stores have separate terminals specifically for balance inquiries. Finally, recipients can call the EBT Center computer from any touch-tone phone, key in their case number and PIN, and receive balance information.

Keeping track of the EBT account balance is thus somewhat more complicated than keeping track of coupons. Few recipients considered it difficult, however. Even among those who said the EBT system was harder to use than the ATP/coupon system, less than 10 percent cited difficulty in tracking account balances. This translates into about 1 percent of all recipients reporting tracking difficulties.

Nearly all recipients used the balance information printed on their receipts to keep track of their account balances, as Exhibit 6-4 shows, and 87 percent reported that this was the main way they kept track. In addition, respondents used the equipment in the store to call the EBT Center for balance information, though most considered this only a secondary means of balance tracking. On average, across both interview waves, only about 15 percent reported using the touch-tone telephone procedures to make balance inquiries. Use of this procedure may have been limited by the fact that less than half of the recipients had touch-tone telephones, and also by frequent malfunctions of the hardware that produced the response to touch-tone inquiries.

Exhibit 6-4

Mechanisms For Keeping Track Of Account Balances Using The EBT System

Mechanism	Percent of Participants Using Mechanisms ^a	
	Early Demon- stration (N=279)	Late Demon- stration (N=286)
Keep receipt showing food stamp balance	95.7%	96.9%
Use benefit transaction terminal in food store	31.2	47.9
Call from home phone	6.1	11.9
Call from another phone	5.7	7.3
Other	7.5	7.3

^aPercents add to more than 100% as participants used more than one mechanism.

Source: Early and Late Demonstration active case surveys, demonstration group.

Food stamp recipients reported few specific problems related to keeping track of their account balances. Only 4 percent of the Early Demonstration respondents and 2 percent of the Late Demonstration respondents reported that, at some time, they had less money in their account than they thought, and that the reason for this was that they had trouble keeping track of their balance. In fact, when asked in the later survey whether they found it easier to keep track of their balances with the EBT card than with coupons, approximately two-thirds who had used both systems said the card was easier.

Other data corroborate these findings. Most retailers reported that recipients sometimes had insufficient EBT benefits to cover their purchases, but few considered it a serious problem. EBT system data show that attempted purchases in which the recipient did not have a sufficient balance represented only 3 percent of all completed purchases. It seems clear, then, that EBT users did not have substantial trouble keeping track of their account balances.

SECURITY OF FOOD STAMP BENEFITS

Both system planners and the recipients surveyed in the Pre-Demonstration period expected the EBT system would improve the security of benefits. When coupons are lost or stolen, the Food Stamp Program does not replace the benefits. In contrast, a lost or stolen EBT card does not necessarily result in lost benefits. As soon as the recipient reports the loss, the Berks County Assistance Office closes the account, moves the benefits to a different account, and issues a new card.

Survey responses during the demonstration support the notion that the EBT system improved security. However, losses were not extensive, even under the ATP/coupon system. About 6 percent of the Early Demonstration comparison group and 4 percent in the Late Demonstration reported instances of lost or stolen coupons in the previous six months. Less than 1 percent of EBT participants (none in the Late Demonstration survey) said that benefits had been stolen from their EBT account.

Responding to a general question about whether they believed their food stamp benefits were secure, most recipients under both systems said yes. Nonetheless, about three-quarters of the EBT participants agreed with a survey statement that "benefits are lost and stolen more with coupons than

with cards." This suggests that food stamp recipients at least perceive the EBT system to be more secure than the coupon system.

SHOPPING PATTERNS

FNS's intent in specifying the EBT system requirements was to avoid forcing recipients to alter their shopping patterns. Still, if a recipient's preferred store decided not to participate in the demonstration, the recipient would have to shop elsewhere. Other aspects of the EBT system might affect recipients' shopping behavior as well. Recipients who give a few dollars in coupons to a child or friend to have them shop might feel differently about handing over the EBT card and PIN. Or recipients might change the type of stores in which they shopped, feeling it too difficult, for example, to use the EBT card to make small purchases at the corner market.

A number of survey questions therefore asked recipients about changes in where they shopped with their food stamp benefits, who did the shopping, and other aspects of the shopping experience.

Changes in Stores Patronized. Most recipients reported that they made no change in where they shop. Ninety-three percent of the recipients said that the EBT system did not cause them to shop in different stores than they used under the coupon system. Once it was clear that virtually all eligible stores would participate in the demonstration, this result was expected.

Some retailers perceived that recipients did somewhat more of their EBT shopping than coupon shopping in supermarkets and convenience stores, and less in the smaller grocery stores (see Section 5.1). Data on actual EBT transactions support this perception, at least for the early months of the demonstration. The proportion of total food stamp redemptions that occurred in supermarkets was 63 percent during July-September 1984. It increased to 66 percent during October-December 1984 (the beginning of the demonstration), and peaked at 71 percent during January-March 1985. Grocery stores experienced a concurrent decrease in their share of food stamp redemptions. However, beginning in April 1985, the redemptions in supermarkets began to decrease

relative to the redemptions in grocery stores, though the relative proportions never returned to their pre-demonstration levels.¹

These data indicate that there was a slight shift from grocery store shopping to supermarket shopping during the EBT demonstration, despite the fact that recipients did not perceive that they made any changes in their shopping patterns.

Changes in Shopper. The EBT system apparently had equally little effect on who did the shopping with food stamp benefits. Over 96 percent of the respondents in both surveys reported that they did not have to make any change in who did the food shopping. Those few participants who reported a change generally began doing the shopping themselves instead of sending another household member, generally a child. Interestingly, grocers perceived a larger shift in who did the shopping than did recipients. Twenty-one percent of grocers reported a shift in who did the shopping, with the mother doing more now than previously. One reason the perceptions of recipients and grocers differ could be that the change did not affect recipients significantly, so that they tended to forget about it. Another reason might be that recipients only considered changes in who did the major shopping trips, and did not consider it a change if they no longer sent a child to the corner store to buy milk. In any event, the change was in the general direction that was expected, and did not appear to have much effect on recipients.

Shopping Frequency. EBT participants report shopping more frequently than do recipients under the ATP/coupon system. Only 13 to 19 percent of coupon users said they shopped at least once a week, compared with 27 to 35 percent of EBT respondents. However, most recipients in both systems said they shopped with food stamp benefits once or twice a month (Exhibit 6-5).

It is unclear why recipients should shop more often with EBT cards, and it is possible that the responses are inaccurate. It is also possible that recipients remember their EBT purchases better because they have a receipt. EBT system records indicate that recipients averaged 7 to 9 transactions per month, while the responses in Exhibit 6-5 imply only about half that many. The reasons for this discrepancy are unclear. Several hypotheses were

¹Susan Bartlett and Margaret Hart, Food Stamp Recipients' Patterns of Benefit Redemption. Cambridge, MA: Abt Associates, May 1987, pp. 63-64.

Exhibit 6-5

**Frequency Of Shopping Trips:
ATP/Coupon Users Versus EBT Users**

Demonstration Period:	ATP/Coupon				EBT Users	
	Pre-Demo. Group (N=286)	Pre-Comp. Group (N=279)	Early Comp. Group (N=285)	Late Comp. Group (N=285)	Early Demo. Group (N=282)	Late Demo. Group (N=279)
Once a month	58.0%	60.7%	55.7%	61.6%	35.8%	43.5%
Every other week	23.1	22.1	30.9	21.9	29.0	29.8
Once a week	11.9	11.2	8.9	10.4	20.8	16.1
More than once a week, but not every day	4.5	5.3	4.6	6.1	11.8	8.1
Every day	2.4	0.7	0	0	2.2	2.1
More than once a day	0	0	0	0	0.4	0.4

Source: Pre-, Early, and Late Demonstration active case surveys.

tested and rejected, including: respondents report the number of shopping trips they make and not the separate EBT transactions; recipients may go to several stores during one large shopping trip and then report this as one shopping event; respondents may not remember the small trips they make to buy a loaf of bread.¹ The conclusion is thus that recipients simply do not recall all the shopping trips they make.

The EBT system has no features that would require recipients to shop more often than they shop with coupons. Thus, if EBT recipients actually do make more purchases, they presumably do so out of choice rather than necessity, and the behavior does not indicate a problem with the issuance system.

Stigma. Procedures at the checkout counters make food stamp recipients immediately identifiable to store personnel and to other customers. Although this is equally true of the coupon and EBT systems, some observers have speculated that the EBT system might have a "high tech" image that would reduce the stigma associated with receiving food stamp benefits. Indeed, a few respondents to the Pre-Demonstration survey expressed an expectation that the EBT system would be "less embarrassing."

Survey data contain hints that the EBT system may have reduced stigma, but if such an effect occurred it was very small. The surveys asked recipients whether store personnel treated food stamp customers better, about the same, or worse than other customers (Exhibit 6-6). The percent saying "better" was slightly higher and the percent saying "worse" slightly lower for EBT recipients than for others. The responses certainly do not indicate a major effect, but they are consistent with the hypothesis that the EBT system caused some reduction in the stigma attached to receiving food stamp benefits.

TOTAL NUMBER OF PROBLEMS REPORTED

Less than 10 percent of the recipients reported having difficulty with any given aspect of the EBT system. The low frequency of any particular problem makes it difficult to see meaningful patterns across groups, so we created a summary measure of the total number of problems reported during the six months prior to the survey. Exhibit 6-7 shows the percent of recipients reporting any problem, and the average number of problems by various demographic characteristics.

¹Ibid., p.19.

Exhibit 6-6

Recipient Perception of Treatment By Grocers:
ATP/Coupon Users Versus EBT Users

Demonstration Period: Food Stamp Recipients Are Treated:	ATP/Coupon Users				EBT Users	
	Pre- Demo. Group (N=286)	Pre- Comp. Group (N=285)	Early (N=283)	Late (N=277)	Early (N=279)	Late (N=286)
Better than others	3.5%	2.5%	2.5%*	2.5%*	7.2%*	11.2%*
About the same	82.9	81.8	82.7	78.3	81.4	76.9
Worse than others	11.9	14.7	14.5	17.0	10.4 ⁺	9.4
Don't know	1.7	1.1	0.4	2.2	1.1	2.4

Source: Pre-, Early, and Late Demonstration active case surveys.

Statistical significance (EBT vs. coupon users): +, $P < 0.10$; *, $P < 0.05$.

Exhibit 6-7

Number of Problems Reported by EBT Users^a
by Demographic Characteristics

Demographic Characteristic	Percent with no Problems	Early Demonstration Number of Problems		Number of Respondents	Percent with no Problems	Late Demonstration Number of Problems		Number of Respondents
		Mean	Standard Deviation			Mean	Standard Deviation	
<u>Race</u>								
White	35.5	1.27	1.27	141	50.7	0.77	0.99	138
Black	22.9	1.34	1.26	35	44.8	0.93	1.07	58
Other	38.8	1.29	1.53	103	59.6	0.63	0.92	89
<u>Public Assistance Recipient</u>								
Yes	28.3*	1.52*	1.39	138	50.3	0.85	1.10	151
No	41.8*	1.06*	1.30	141	54.8	0.64	0.84	135
<u>Age</u>								
Less than 40	29.8*	1.43	1.36	168	44.7*	0.96 ⁺⁺	1.12	161
40-59	40.0	1.09	1.38	65	56.6	0.57 ⁺⁺	0.72	76
60 and older	47.8*	1.04	1.35	46	72.9*	0.35 ⁺⁺	0.67	48
<u>Handicapped</u>								
Yes	42.2	1.23	1.38	64	60.0	0.57	0.81	65
No	33.0	1.30	1.37	215	50.2	0.81	1.03	221
<u>Education</u>								
Less than 9 years	37.0	1.27	1.52	81	59.5	0.55*	0.75	84
9-12 years	36.0	1.29	1.32	178	48.9	0.86*	1.08	184
13 years and over	21.1	1.32	1.20	19	50.0	0.69	0.87	16
<u>Language</u>								
English	33.5	1.28	1.27	185	49.8	0.79	1.00	209
Other	38.3	1.31	1.55	94	59.7	0.66	0.97	77
<u>Sex</u>								
Female	33.8	1.32	1.38	234	51.1	0.80	1.02	237
Male	40.9	1.16	1.27	44	59.2	0.55	0.82	49

^aProblems include: forgot Pin; got new PIN; computer down at checkout; grocer error; difficulty keeping track of balance; inability to get balance; card lost; card stolen; card damaged; received benefits late; received less benefits than entitled; benefits stolen; changed shopper; changed grocery store; household member used card without permission; dissatisfied with training; insecure about benefits.

Source: Early and Late Demonstration active case surveys, demonstration group.

Statistical significance, differences among groups: *, $P < 0.05$; ⁺⁺ (< 40 and 40-59; < 40 and 60+), $P < 0.05$.

Somewhat more than two-thirds of the Early Demonstration respondents reported at least one problem, as did somewhat more than half of the Late Demonstration respondents. However, no striking differences are discernible across demographic groups. Only a few comparisons are statistically significant, and none are significant in both survey periods.

SUMMARY OF EXPERIENCES WITH THE EBT SYSTEM

In general, food stamp recipients experienced few problems with the EBT system and as a result, most preferred EBT to the food stamp coupon system. These patterns applied quite generally across demographic groups, with little indication that any groups found the EBT system particularly difficult. No group that was considered potentially vulnerable to difficulties with the EBT system -- the elderly, handicapped persons, and people with limited education or ability to speak English -- reported a higher-than-average incidence of problems.

6.3 TIME AND MONEY COSTS OF PARTICIPATING IN THE FOOD STAMP PROGRAM

Recipients incur time and money costs participating in the Food Stamp Program. Some of these participation costs are specifically related to the issuance system. These include the costs of obtaining benefits and the costs of dealing with any problems relating to the receipt of benefits, including the cost of lost or delayed benefits. This section presents estimates of recipients' participation costs under the ATP/coupon and EBT systems for each type of cost.

Recipients also spend time and money on shopping trips. These costs would not normally be considered food stamp participation costs, because the trips would still be needed if the recipients were using cash rather than food stamp benefits. If many stores had decided not to participate in the EBT system, recipients might have had to change grocery stores, in which case the incremental cost (if any) of the trips could be considered a participation cost. Because virtually all eligible stores participated in the demonstration, however, and because few recipients indicated that the system caused them to shop in different stores, shopping costs are not covered in this analysis. EBT users did report shopping more frequently than coupon users; this is not considered a cost, however, because the EBT system did not require

the additional shopping. Extra time spent in the checkout line might be considered a cost, but for each household this typically amounted to only a few seconds per purchase and is not included.

COSTS OF OBTAINING FOOD STAMP BENEFITS UNDER THE ATP SYSTEM

People desiring food stamp benefits under any issuance system must make an initial visit to the welfare office to apply for benefits; therefore, our cost calculations do not include this initial visit. After they are certified, recipients under the ATP system receive by mail their identification card and the Authorization-to-Participate document for their first month's benefits. Each month, recipients get new ATP cards in the mail.

To obtain coupons, recipients have to take their ATPs to an issuance office. The issuance offices in Reading are local banks. Thus, every month, recipients incur the time and expense of going to the bank to exchange their ATP for coupons.

Costs include the time spent in transit as well as the time actually spent at the bank. Recipients may also have out-of-pocket expenses in traveling to the bank, such as bus or taxi fare. Some recipients may have to pay a babysitter while they are gone. The surveys asked respondents about the time it took them to get to the bank, the time it took to get their coupons, and any actual expenses they incurred.¹ The tables present only data from the Late Demonstration survey, as results do not differ significantly between the Early and Late periods.

Estimated Costs. Exhibit 6-8 presents the estimated costs of obtaining benefits using the ATP system. Recipients had to make one trip to the bank each month. The total out-of-pocket expense involved in going to the bank was about \$1.40. Babysitting expenses were low, as less than 4 percent reported having to hire a babysitter. About 40 percent of the respondents said they walked to the bank, which kept the average transportation costs fairly low as well. The total travel time to and from the bank was about 30 minutes. Recipients averaged 15 to 20 minutes at the bank getting their

¹ Appendix VI-C (pp. VI-25-27) discusses the cost estimation procedures in more detail.

Exhibit 6-8

Costs Of Obtaining Food Stamp Benefits
Under The ATP System^a

	Late Demon- stration (N=279)
<u>Out-of-pocket costs</u>	
Transportation costs	\$1.36 (1.76)
Babysitting costs	\$0.07 (0.73)
Total costs	\$1.43 (1.85)
<u>Time involved in going to the bank</u>	
Travel time in hours	0.51 (0.35)
Hours spent in bank	0.26 (0.25)
Total time	0.77 (0.46)

^aNumbers are the means across the sample. Standard deviations are in parentheses.

Source: Late Demonstration active case survey, comparison group.

coupons, which meant they spent approximately 45 minutes every month getting their food stamp coupons.

COSTS OF OBTAINING FOOD STAMP BENEFITS UNDER THE EBT SYSTEM

To obtain benefits in the EBT system, recipients go to the Berks County Assistance Office for a card and training. Typically, this involved two visits to the welfare office, one for normal certification procedures (the cost of which is not included, as it is the initial visit), and a second to get the EBT card and be trained. Once recipients had their EBT cards, benefits were electronically added to their accounts each month, and they simply presented their card when they wanted to purchase food. (Further actions were required if a problem occurred with the card, but these are covered in the next segment of the analysis.) EBT participants' costs of obtaining benefits are therefore the one-time costs of going to the BCAO to receive EBT training and obtain their card.

Estimated Costs. Exhibit 6-9 presents the estimated costs of obtaining benefits under the EBT system. The exhibit shows the mean for each component for all the trips the recipient made to the welfare office. The average number of trips was about 1.5.

Out-of-pocket expenses averaged less than \$1.50 per trip. Transportation costs accounted for \$0.70. About half of the recipients reported that they walked to the BCAO, and thus had no transportation costs. The others incurred some costs, such as bus or taxi fare. Babysitting costs were relatively low, only \$0.60 on average, because only 10 percent of the recipients reported that they had to hire a babysitter when they went to the welfare office. On average, recipients spend 17.5 months in the Food Stamp Program.¹ Amortizing the initial costs over recipients' entire period in the program yields monthly out-of-pocket costs of \$0.08.

Recipients spent slightly over 2½ hours obtaining their benefits. Travel time to and from the welfare office (counting multiple trips) was

¹This figure is based on the fact that the average monthly approval rate of new cases is 5.7 percent in Reading, and that the size of the caseload was relatively constant. This translates into an average spell of 17.5 months in the program.

Exhibit 6-9

Costs of Obtaining Food Stamp Benefits under the EBT System^a

	Late Demon- stration (N=280)
<u>Out-of-pocket costs</u>	
Transportation costs	\$0.70 (1.54)
Babysitting costs	\$0.63 (2.50)
Total costs ^b	\$1.33 (2.96)
Total costs, on a monthly basis ^c	\$0.08 (0.17)
<u>Time involved in going to the welfare office</u>	
Travel time, in hours	0.87 (0.84)
Hours spent at office	1.49 (0.98)
Total time	2.37 1.39
Total time, on a monthly basis ^c	0.14 (0.08)

^aNumbers are the means across the sample. Standard deviations are in parentheses.

^bThere are no significant differences between the demonstration and comparison groups in the Pre-Demonstration survey that affect the observed differences in costs between EBT and ATP users.

^cTotal costs + 17.5 months (the average spell of program participation).

Source: Late Demonstration active case survey, demonstration group.

approximately 1 hour. Recipients spent about 1½ hours in getting their EBT card and being trained in its use.¹ This translates into 0.14 hours per month.

The average monthly costs and time associated with obtaining benefits were clearly greater in the ATP than the EBT system. The main reason for the difference is that ATP recipients had to make a trip each month to obtain their benefits, while EBT users had only one initial trip.

COST OF LOST OR DELAYED BENEFITS IN THE ATP SYSTEM

Food stamp benefits can be delayed or lost under the ATP/coupon system at two points. Delays can occur before coupons are obtained -- that is when the ATP card is mailed each month or during the process of exchanging the ATP card for food stamp coupons, or after the recipient has the coupons, when they can be lost or stolen or the recipient may be overcharged for groceries purchased using coupons.

Overall, coupon users experienced few problems relating to lost or delayed benefits. The largest problem, in terms of the number of recipients involved, was receiving the ATP card late.² Four percent of Late Demonstration respondents said they experienced this problem at least once in the prior six months. All recipients eventually received their ATP card, so their benefits were only delayed.

Smaller numbers of recipients reported other ATP problems. Less than 4 percent of the sample reported receiving an ATP card they thought was wrong, and about one-third of these problems were reported corrected.

¹There are, however, some indications of error associated with this time variable. About 20 percent of the respondents reported that they spent less than 1 hour in the welfare office. The training session is supposed to take an hour, suggesting people may underreport their time. However, there are instances where a report of less than 1 hour may be accurate. For example, if the recipient had used the system before, the training session may have been shortened. We don't have any information on how often this was the case. In addition, 2 percent of the sample said it took them over 3 hours in the welfare office, which may be accurate, but does seem quite high.

²Appendix VI-B, Exhibit VI-B7 (p. VI-19) presents the data on the number on incidents involving lost or delayed benefits, and the value of the benefits involved.

Recipients who lost or damaged their ATP card or had it stolen were all able to get the card replaced, leading to delays rather than lost benefits. Because lost or stolen coupons are not replaced, they were a greater source of benefit loss than ATP cards. The number of people who suffered such losses was small, but the benefits involved were completely lost to the recipient.

Approximately 4 percent of the ATP/coupon users reported that the grocery store overcharged them at some time, and most recipients who had this problem said that it happened more than once. The values of benefits involved were relatively small, however, averaging \$6 per incident.

Estimated Costs. To estimate the costs of using the ATP/coupon system, we need to put a value on the lost or delayed benefits. Lost benefits are simply valued at the total amount of the loss. For delayed benefits, we calculated the opportunity costs of the delay, which is the interest the recipient would have to pay to borrow a sum of money equal to the value of the delayed benefits.¹ Exhibit 6-10 presents estimates of the opportunity costs resulting from lost or delayed food stamp benefits. Estimates are on a monthly basis, computed as the average over a 6-month period. We present only Late Demonstration survey data as there are no significant differences in the opportunity costs between surveys.

The average costs of delayed or lost benefits in the ATP/coupon system are relatively small, amounting to 74 cents per month in the Late Demonstration survey. This is to be expected, given the low incidence of reported problems. The largest component is the cost of lost and stolen food stamps, which totaled 35 cents per case month.

The costs associated with receiving an ATP card with an incorrect benefit amount were estimated at 33 cents per case month in the Late Demonstration survey. Approximately one-third of the estimated total is attributable to one respondent, and thus may be an overestimate.

¹Appendix VI-C (pp. VI-25-27) contains more detailed information on how these costs are calculated.

Exhibit 6-10

Opportunity Costs per Month of Lost or Delayed Benefits
and Other Errors: ATP Comparison Group^a

Problem	Late Demon- stration (N=279)
ATP card late	<\$0.01 (0.01)
ATP card had less benefits than supposed to	0.33 (2.89)
ATP card stolen	0
ATP card lost	<0.01 (0.008)
ATP card damaged	<0.01 (0.002)
Received less coupons than on ATP card	0
Coupons not at bank	<0.01 (<0.001)
Coupons lost	0.27 (2.12)
Coupons stolen	0.08 (0.75)
Grocers' errors	0.05 (0.35)
<u>Total</u>	\$ 0.74 (3.65)

^aNumbers are the means across the sample. Standard deviations are in parentheses.

Source: Late Demonstration active case survey, comparison group.

COSTS OF LOST OR DELAYED BENEFITS IN THE EBT SYSTEM

A number of problems can result in delays or actual loss of food stamp benefits in the EBT system. Each month, EBT accounts are credited with the benefit allotment. Problems arise when recipient accounts are credited late or for an amount that is less than the entitlement.¹ Only about 6 percent of the respondents in the Late Demonstration survey reported that they ever had their benefits credited late and 2 percent reported that they received less in benefits than they were entitled to receive.

Recipients lose, at least temporarily, use of their food stamp benefits if their EBT card is stolen, lost, or damaged. Few respondents experienced these problems, and most incidents did not result in a permanent loss. Instead, recipients lost access to their benefits until they got a new card.² Few participants who lost their card or had it stolen said they lost benefits from their account. It appears that recipients' benefits were relatively secure under the EBT system, even when their cards were lost or stolen.

One concern prior to the start of the demonstration was that cashiers might easily make mistakes during the EBT transaction, for example by keying in \$50 instead of \$5. However, only a handful of respondents reported that they had ever been overcharged.

Estimated Costs. The costs of delayed or lost EBT benefits are quite small. Total monthly costs for all types of problems are only 10 cents in the Late Demonstration survey, as Exhibit 6-11 shows. This results in part from the infrequency with which recipients encountered problems. In addition, most problems resulted in delayed benefits, not permanently lost benefits, and the opportunity costs of delays are uniformly very low.

¹Appendix VI-B, Exhibit VI-B8 (p. VI-20) contains data on the number of incidents and value of the different types of loss.

²One Late Demonstration respondent reported never replacing his/her EBT card. This recipient may have lost only a small amount of benefits, or may have recently left the Food Stamp Program, so did not attempt or did not receive a new card. We assume the opportunity costs of the inaccessibility to benefits is zero, because the recipient did not get the problem corrected.

Exhibit 6-11

Opportunity Costs per Month of Lost or Delayed Benefits
and Other Errors: EBT Demonstration Participants^a

	Late Demon- stration (N=280)
Benefits credited to account late	\$0.01 (0.05)
Less benefits credited to account	0.05 (0.60)
EBT card stolen	<0.01 (0.01)
EBT card lost	<0.01 (0.01)
EBT card damaged	0.01 (0.04)
Benefits stolen from account	0
Retailers' errors	0.03 (0.48)
Total	\$0.10 (0.77)

^aNumbers are the means across the sample. Standard deviations are in parenthesis.

Source: Late Demonstration active case survey, demonstration group.

COSTS OF DEALING WITH PROBLEMS IN THE ATP/COUPON SYSTEM

Recipients incur measurable costs to deal with the problems discussed above, if they have to phone or go to the welfare office or the bank to get the problem resolved. Less than 10 percent of coupon users reported making phone calls to deal with problems. With such a small number making calls, and because we have no information on the length of the calls, we have not included these in our cost calculations. Calculations of the cost for trips to the bank or welfare office are the same as the calculations of the costs for obtaining benefits. Out-of-pocket expenses include transportation and child care costs. It takes time to make the trip and time at the bank or welfare office to resolve the problems. The total costs and time are presented on a monthly basis.

Only about 14 percent of the comparison sample reported making a trip to the bank or welfare office to deal with problems of lost or delayed benefits. Thus, respondents with no reported costs dominated the calculations shown in Exhibit 6-12. Out-of-pocket expenses were relatively small, less than 4 cents per month. The total time involved was also quite small, only a couple of minutes per month.

COSTS OF DEALING WITH PROBLEMS IN THE EBT SYSTEM

Approximately 14 percent of all recipients using the EBT system had to go to the BCAO to deal with problems. These recipients made an average of about 1.5 trips. Other recipients resolved their problems by telephone; some problems, such as delayed monthly benefits, worked themselves out without the recipients doing anything.

The average cost and time involved in dealing with EBT problems is shown in Exhibit 6-13. Total cost is quite small, amounting to 6 cents per case month. The time involved is less than 5 minutes per month.

Total costs for both EBT and ATP/coupon users were quite small, as only a small number of recipients had to go to the welfare office or bank to

Exhibit 6-12

**Costs per Month of Trips to the Bank and Welfare Office
to Deal with Problems: ATP Comparison Group^a**

	Late Demon- stration (N=279)
<u>Costs involved in going to the bank</u>	
Out-of-pocket costs:	
Transportation costs	\$0.02 (0.10)
Babysitting expenses	0.01 (0.13)
Time involved:	
Travel time, in hours	0.015 (0.036)
Hours spent in bank	0.015 (0.024)
<u>Costs involved in going to the welfare office</u>	
Out-of-pocket costs:	
Transportation costs	\$0.01 (0.05)
Babysitting expenses	0.01 (0.10)
Time involved:	
Travel time, in hours	0.018 (0.075)
Hours spent in welfare office	0.01 (0.01)
<u>Total costs, and time of dealing with problems, per month</u>	
Out-of-pocket costs	\$0.04 ^b (0.22)
Time, in hours	0.02 ^b (0.09)

^aNumbers are the means across the sample. Standard deviations are in parentheses.

^bComponents do not add to total due to rounding.

Source: Late Demonstration active case survey, comparison group.

Exhibit 6-13

Cost Per Month In Trips To The Welfare Office
To Deal With Problems: EBT Demonstration Participants^a

	Late Demon- stration (N=280)
<u>Out-of-pocket costs</u>	
Transportation costs	\$0.01 (0.10)
Babysitting expenses	\$0.07 (0.73)
Total costs, per month	\$0.08 (0.77)
<u>Time involved in going to the welfare office</u>	
Travel time in hours	0.03 (0.14)
Hours spent at office	0.03 (0.13)
Total time, per month	0.06 (0.25)

^aNumbers are the means across the sample. Standard deviations are in parentheses.

Source: Late Demonstration active case survey, demonstration group.

TOTAL COSTS OF PARTICIPATION IN FOOD STAMP ISSUANCE SYSTEMS

The total out-of-pocket or direct costs and total time required to use food stamp coupons exceeded the costs and time of using the EBT system. ATP recipients incurred average direct costs of \$2.22 per month, compared with an average of \$0.23 for EBT recipients. ATP recipients spent approximately 50 minutes each month obtaining benefits and dealing with problems, and EBT participants spent only about 12 minutes per month. These differences are statistically significant at the 95 percent confidence interval.

Participation costs were greater in the ATP/coupon than the EBT system for two reasons. The primary reason is that ATP recipients make monthly trips to the bank to pick up their coupons, while EBT users have only a visit to the welfare office to pick up their cards and be trained in card use. The second factor is that the costs associated with lost or stolen benefits were higher in the ATP/coupon system, whereby lost or stolen coupons are not replaced, and thus recipients lose the total value of the benefits. In the EBT system, it is virtually impossible for recipients to lose benefits. They may lose their card, but that can be easily replaced.

In order to come up with a single figure to represent the cost of using the ATP system or the EBT system, we need to put a dollar value on the time required of food stamp recipients to participate in the program. Exhibit 6-14 presents two different cost estimates, based on assigning different hourly values to the time recipients spend obtaining and using their benefits. One estimate values time at the federal minimum wage of \$3.35 an hour. The advantage of this estimate is that it values all hours as if they were spent working. However, it undoubtedly underestimates the wages recipients would earn if they worked, as it represents the minimum they could be paid. On the other hand, the value probably overestimates the value of time not spent in paid employment. A study of AFDC mothers found that they valued such time at 36-48 percent of their hourly earnings.¹ The second estimate reflects the actual earnings of food stamp recipients in Pennsylvania, averaging in the recipients who did not work at all. Using this

¹Larry L. Orr, "AFDC Homemaker-HomeHealth Aide Demonstration Benefit Costs," Abt Associates Inc., December 1986, p.75.

Exhibit 6-14

Summary Of Monthly Costs Of Participating In
The Food Stamp Program: Demonstration Vs. Comparison Groups^a

Demonstration Period:	ATP Comparison Group	EBT Demonstration Group
	Late (N=279)	Late (N=280)
Direct costs of obtaining benefits ^b	\$1.43* (1.85)	\$0.08* (0.17)
Opportunity costs of lost or delayed benefits	\$0.74* (3.65)	\$0.10* (0.77)
Direct costs of dealing with problems ^b	\$0.04 (0.22)	\$0.08 (0.77)
Total direct costs per month of program participation	\$2.21* (4.02)	\$0.26* (1.16)
Hours spent obtaining benefits and dealing with problems	0.80* (0.48)	0.20* (0.28)
Value of time, at \$0.28 an hour	\$0.22* (0.13)	\$0.06* (0.08)
Value of time, at \$3.35 an hour	\$2.67* (1.61)	\$0.66* (0.93)
Total costs per month of program participation (time valued at \$0.28 per hour)	\$2.44* (4.02)	\$0.32* (1.20)
Total costs per month of program participation (time valued at \$3.35 per hour)	\$4.89 (4.35)	\$0.92* (1.80)

^aNumbers are the means across the sample. Standard deviations are in parentheses.

^bDirect costs refer to out-of-pocket expenses for babysitting and travel.

Source: Late Demonstration active case survey.

*Statistical significance (EBT vs. ATP, groups): *, $P < 0.05$.

method, time is valued at 28 cents an hour.¹ The advantage of this estimate is that it reflects the fact that most recipients did not actually lose wages during the time they spent obtaining and using benefits, because only a small proportion were employed. The disadvantage of this estimate is that it places a zero value on time not spent in paid employment.

Total monthly costs of program participation, valuing time at 28 cents per hour, are \$2.44 under the ATP/coupon system and \$0.32 under the EBT system. If we valued time at the minimum wage, these figures would be \$4.89 and \$0.92, respectively. However we value time, the conclusions are clear, that the costs of participating in the Reading Food Stamp Program were lower under the EBT system than the ATP coupon system.

One fact to keep in mind when attempting to generalize these results to programs in other areas is that the coupon system used in Reading required recipients to make monthly trips to pick up their coupons. In some areas, coupons are mailed directly to recipients, and thus recipients incur no monthly expenses. The costs of participating in the Food Stamp Program under a coupon system that mailed benefits would be substantially lower than under the system used in Reading. In fact, the cost to recipients in a mail system would probably be similar to those under the EBT system.

6.4 EBT EFFECT ON PROGRAM PARTICIPATION

As previously shown, recipients in the demonstration project were quite pleased with the EBT system and generally found it preferable to the ATP/coupon system. The EBT participants experienced few problems and, on average, had lower participation costs than coupon users. Given these findings, it would be surprising to find that the EBT system caused some recipients to stop participating in the Food Stamp Program. The analysis offers no such surprise, finding no effect of the EBT system on closure or participation rates.

¹See Appendix VI-C (pp. VI-25-27) for a more detailed discussion of the derivation of the estimates.

CASELOAD AND CLOSURE PATTERNS

State records provided data on the number of food stamp recipients in Berks County, by month, separately for participants in the demonstration area, the comparison area, and the remainder of the county. These data indicate that neither closure rates nor the size of the caseload were affected by the EBT demonstration.¹

The caseload in all three parts of Berks County declined during much of 1984 and then leveled off, though some groups experienced greater declines than others. The comparison group caseload declined the least. The caseload in the demonstration area declined more than in the comparison area. However, the caseload for the rest of Berks County showed the most dramatic decline. The general economic recovery in 1984 presumably explains the decline in the food stamp caseload. The EBT demonstration had no apparent effect on overall caseload, as the demonstration area figures followed a trajectory in between that for the comparison area and that for the rest of Berks County.

Patterns of case closure rates over time were similar to the caseload patterns. The comparison group had the lowest closure rates during all the months between March 1984 and December 1985, fluctuating around 4 percent. Closure rates for the demonstration group fluctuated around 6 percent. Recipients in the remainder of Berks County experienced the highest closure rates, around 9 percent each month.

There is no evidence that the demonstration affected the caseload or closure rates. Although month-to-month fluctuations occurred, the fluctuations in the demonstration group follow much the same patterns as those in the other two groups. In particular, there is no sign of a peak during the start-up period of October-January or higher closure rates and lower caseload levels after October.

REASONS FOR CASE CLOSURE

Even though the EBT system appears, in the aggregate, not to have increased the number of recipients leaving the Food Stamp Program, it was

¹See Appendix VI-B, Exhibits VI-B11 (p. VI-23) and VI-B12 (p. VI-24).

hypothesized that some individuals might find the system sufficiently troublesome to leave. To examine that possibility, we interviewed individuals who stopped receiving benefits in the months immediately before and after the demonstration started, to get their own statements of why they left the program.

The general pattern of responses was virtually identical before and after the implementation of the EBT system. Two-thirds of the former recipients said their family circumstances had changed -- e.g., their income had increased, and made them ineligible. Respondents who gave other reasons for case closure were asked whether the EBT system had anything to do with their closing. Only one individual in the Pre-Demonstration survey said the (planned) demonstration was a factor, and 12 Early Demonstration respondents gave this response. The latter 12 respondents represent about 3 percent of all closures, or about 0.1 percent of the overall caseload.¹

Half of the 12 respondents indicating an EBT-related reason for closure said that it was too much trouble to go to the welfare office for their card or to learn the system, given the small amount of benefits they received. All of these respondents had received allotments under \$30 per month. In addition, all were over 60 years old.

Of the remaining respondents, five reported that they were ill and could not go out either to get their EBT card or to do their shopping. Whether they could have kept participating in the ATP/coupon system, with its requirement for a monthly trip to the bank, seems dubious. One Spanish-speaker simply felt the system was too complicated. Again, most of these respondents were elderly.

These responses indicate that the EBT system may be an obstacle to program participation for a few individuals, those who are likely to be elderly or ill. At the same time, it should be remembered that most elderly and physically handicapped participants preferred the EBT system over coupons. The individuals whose participation is affected by the EBT system

¹The 12 responses represent about 5 percent of those interviewed. The 3 percent estimate results from adjusting for the members of the original sample who were found to have moved out of the area or moved to unknown locations, who are assumed to have terminated for reasons related to the move and not to the EBT system.

seem to be people who would also seem likely to have great difficulty participating in the ATP/coupon system.

It would be worthwhile for a food stamp policy to address the kinds of problems posed by the respondents who indicated EBT-related closures. However, because these people represent such a small proportion of the total caseload, and even a small proportion of those cases that closed, the most difficult aspect of helping them will be identifying them.

The fact that the demonstration did not affect program participation can probably be partly attributed to the efforts of the PDPW to track down eligible recipients who did not show up for the regularly scheduled training. The thoroughness of the training was also undoubtedly a factor in retaining people in the program.

6.5 CONCLUSIONS

Food stamp recipients generally had very positive reactions to the EBT system. In their expressed preferences, recipients favored the EBT system over the ATP/coupon system by a four-to-one margin. At least 70 percent of all demographic groups preferred the EBT system, compared with a maximum of 25 percent in any group preferring coupons.

Recipients apparently had little difficulty adapting to the new system, and said they found it generally easier to use than the coupon system. The EBT system significantly reduced recipients' time and money costs of participating in the Food Stamp Program, mainly by eliminating the monthly trip to convert ATPs to coupons and by making recipients' benefits more secure.

Planners worried before the demonstration that many food retailers would choose not to participate in the EBT system. If this happened, some recipients would be forced to change their shopping patterns, perhaps spending more time and money by shopping farther from home or in more expensive stores. Nevertheless, virtually all eligible stores did choose to participate, so recipients did not have to alter their shopping patterns.

Another concern was that requiring recipients to use sophisticated computer equipment might leave many unable to cope. This did not occur. Recipients clearly found food shopping less difficult with the EBT system than

with coupons. Paying for groceries using the EBT card simply required recipients to present their card to the cashier and then to remember their four-digit identification code. Paying with coupons, in contrast, meant adding up an appropriate number of coupon books and individual coupons, and tearing the individual coupons out of the book. The coupon system may, in fact, require more computation skills than the EBT system, and certainly requires more effort.

Recipients using the EBT system did have to work harder to keep track of their benefits than coupon users. Recipients using coupons could readily determine the amount of benefits they had at any given time. When they went to the bank to get their coupons, they had their month's benefits in hand. Subsequently, counting the coupons in their possession tells their "current balance".

The food stamp benefits of EBT users are less tangible. Their accounts were credited each month, but they received no notification of the credits. Recipients could determine their account balance by several means, but only one--their receipt from a purchase or refund transaction--required no specific effort from the recipient and produced a written record. Not surprisingly, the receipt was the recipients' primary means of keeping track of their benefits. Despite the apparent demands of the EBT system, however, recipients reported few problems in balance tracking and rarely mentioned this as a drawback of the system.

In conclusion, recipients considered the EBT system comparable or superior to the ATP/coupon system in all major respects. The analysis of participation costs is consistent with their opinions, finding that recipients spent less time and money using the EBT than the ATP/coupon system. The recipient's own responses suggest that the EBT system's ease and convenience at the checkout counter was a more important factor in their choice. Overall, the system benefited many recipients and did not cause serious difficulty for any identifiable group.

Chapter Seven

EFFECTS OF THE EBT SYSTEM ON FINANCIAL INSTITUTIONS

The food stamp coupon system uses the operational capabilities of commercial banks and the Federal Reserve Bank (FRB). In many locations, including Reading, banks act as issuance agents and give food stamp coupons to clients when clients present their Authorization-to-Participate cards. Banks then receive coupons back from grocers once recipients have used them to purchase food items. Commercial banks send redeemed coupons to the Federal Reserve, where they are destroyed. Both the commercial banks and the Federal Reserve perform accounting and settlement functions for the dollars represented by redeemed food coupons.

Banks have been vocal in their displeasure with the current food stamp system. Their role in issuance sometimes leads to unwanted lobby traffic in branch banks that the banks view as disrupting their normal business. Their role in redemption requires special, labor-intensive tasks which are exceptions amid their larger-scale check processing operations. Redemption also causes float, because banks usually credit funds to merchants' accounts before the banks receive credit from the Federal Reserve.

Based on these observations, it was hypothesized at the outset of the EBT demonstration that commercial banks would prefer an EBT system over the current paper system. The electronic system would eliminate any issuance-related disruptions at bank branches and reduce banks' costs in redemption. The Federal Reserve's processing and destruction of redeemed coupons represents a small appendage to normal operations, but it was expected that this institution also would prefer an Electronic Benefit Transfer system.

OVERVIEW OF RESEARCH STRATEGY

The primary research objective was to estimate the costs to financial institutions--both commercial banks and the Federal Reserve Bank--of participating in the Food Stamp Program. Costs include direct operating cost (e.g., labor, vaulting, data transmission) as well as float and liability for loss. Both the commercial banks and the Federal Reserve Bank receive

compensation for some food stamp-related functions, and this was measured as well.

In addition to measuring costs, the research examines the opinions and preferences of officials in the participating financial institutions. Key issues were whether the bankers preferred the ATP/coupon or EBT system, the reasons for their preference, and whether their EBT experience influenced their attitudes toward POS systems in general.

The research centered around interviews with personnel from four local banks participating in the Reading demonstration and the Federal Reserve Bank of Philadelphia. Three waves of interviews were conducted: one before the demonstration system began operations, one after a few months of actual experience with the EBT system, and one near the end of the demonstration. The questionnaires differed somewhat between waves, and in each wave separate questionnaires were used for local banks and the Federal Reserve Bank of Philadelphia. The differences between waves were that the questionnaires asked more about experience with the EBT system as time went on.

A structured but open-ended questionnaire, or interview guide, was used for each wave of interviews. The questionnaires probed the respondents' attitudes toward the EBT system, particularly in contrast to the paper coupon system, and requested data concerning procedures, costs, revenues, and transaction volumes. In addition to the formal interviews, various other officials at participating banks were contacted for specific information. For example, queries were made to the Vice President of EFT Marketing and Planning and to the Cost Accounting Department at American Bank and Trust (AB&T) in an effort to determine the bank's cost of originating Automated Clearing House (ACH) transactions for the EBT demonstration.

In both the commercial banks and the Federal Reserve, food stamp activities make up a tiny portion of the overall operation, and very few data directly describing these activities are available. Estimates are based on a combination of interview data and data from Bank Earnings International's (BEI) files of financial data on banks. BEI has performed consulting services for hundreds of banks and maintains a large data base of operating statistics, particularly in the area of item processing.

HIGHLIGHTS

As expected, representatives of the participating financial institutions strongly prefer the EBT system to the ATP/coupon system. Our estimates indicate that the EBT system has clear financial advantages for the commercial banks, principally because it reduces the (uncompensated) labor-related costs of redeeming food stamp benefits.

With respect to issuing coupons, the available data suggest that issuance fees exceed the banks' operating costs. Nonetheless, bank representatives were particularly pleased that the EBT system eliminated their role in issuance, apparently because coupon issuance entails disruptions out of proportion to the revenue received.

The EBT system also reduces costs incurred by the Federal Reserve Bank. The FRB receives fees for its food stamp activities, and the fees apparently exceed costs in both the coupon and EBT systems. FRB representatives preferred the EBT system, considering the EBT system more efficient and the coupon system something of an anomaly in their normal operations.

7.1 LOCAL BANKS' ROLE IN COUPON ISSUANCE

Local banks in Reading serve as issuance offices for the Food Stamp Program under contract with the PDPW. In this role, they receive and maintain inventories of food stamp coupons, exchange recipients' ATP cards for coupons, and provide reconciliation reports to PDPW. To perform these functions, they incur costs associated with teller time and other resources.

The issuance transaction requires the bank teller to carry out several tasks. The teller first must verify that the person presenting the ATP is authorized to use it by watching the recipient sign the ATP and checking the signature against the ID card. The teller also must make sure that the ATP is valid for the current month. The teller then stamps the ATP, counts the coupon books, has the recipient sign the coupon books, and records the transaction. Most banks require recipients to use their ATPs during special hours, unless they obtain special permission because of work responsibilities.

Several problems can complicate the ATP transaction and add to the teller's effort. If the recipient lacks a valid ID, the teller has to send

the recipient to the welfare office for a new one or check with a caseworker that the recipient is eligible. When the presenter of the ATP is someone other than the recipient to whom it was issued, the teller must verify that the presenter has been authorized by the recipient. When recipients cannot sign their names, the teller must obtain witnesses to the recipient's mark. The coupon books are often awkward to handle, frequently sticking together. Some recipients come at the wrong time and have to be turned away and told when to return.

The issuance transaction also creates burdens for bank tellers because of the timing of issuance. Most food stamp households exchange their ATPs for coupons in the first three days after issuance. For example, prior to the demonstration over 5,000 Berks County households received ATPs on the same day each month. Under such circumstances the pressure of the peak transaction load on the issuance offices can be substantial. Some banks reported lines of up to 40 recipients, with a wait of 45 minutes or longer. This pressure creates an unpleasant atmosphere for tellers, recipients, and other bank customers.

Banks maintain inventories of coupon books to support the ATP transaction function. Supervisory tellers check, record, and store coupon shipments, which were received monthly until PDPW changed to a four-month delivery cycle (see Section 3.2 for details). Some banks receive shipments at a central office and distribute them to their branch offices, where they are checked and recorded again. During the peak issuance period, tellers record inventory changes on a daily basis. Full counts of coupon inventories are done monthly.

Banks complete reconciliation forms (specifically the FNS-250) each month as required by regulations. This report requires monthly inventory figures, along with tallies of coupons transferred in or out of the issuance office and of ATPs exchanged. Completing the FNS-250 may require additional effort if discrepancies are found between the change in the coupon inventory and the total value of ATPs turned in. Banks also have to send the ATPs to PDPW, and are financially responsible for any expired ATPs they accept.

Estimated Costs. Interview respondents said that the cost to the banks of carrying out coupon issuance functions was equal to or greater than the fees they receive from the state food stamp agency. The issuance office

7.2 LOCAL BANKS' ROLE IN COUPON REDEMPTION

The banking system provides the conduit between grocers who receive food coupons as a form of payment for purchases and the U.S. Department of Agriculture, which is the source of the funds represented by the coupons. Grocers bring food coupons to their banks, and the banks credit the dollar amount of the coupons to the grocers' account. The banks then process the coupons and send them to the local Federal Reserve Bank, which acts as Fiscal Agent to the U.S. Treasury. The USDA account at the Treasury is ultimately debited to complete the food coupon transaction.

This section examines the steps taken by Reading banks to receive and redeem coupons deposited by grocers. The actual procedures followed by any particular bank may vary depending on the size of the bank, its number of branch locations, and the volume of coupons it receives.

THE BANK'S COUPON REDEMPTION PROCESS

Food coupons are deposited at bank branches by grocers. A grocer normally assembles all of the cash, checks, and food stamp coupons intended for deposit, bundles together each type of payment as a separate deposit, and prepares a deposit slip for each bundle. For the food stamp deposit, the grocer also fills out a Redemption Certificate. The grocer gives the deposits to the bank teller, who counts the food stamp coupons by denomination and verifies that the total is equal to the total on the deposit slip. If the totals are not equal, the teller recounts the coupons and changes the deposit slip if the grocer's count was wrong. The teller gives the grocer a deposit receipt at the conclusion of the transaction. At this time, the teller also fills out an internal ledger form and attaches it to the food stamp deposit, and completes and attaches the grocer's Redemption Certificate. (Both the grocer's count and the bank's count appear on the Redemption Certificate).

Periodically, the head teller collects food stamp deposits and attached ledger forms from each teller, fills out a transmittal form, and sends these documents by internal bank courier to the appropriate operations area of the bank. Depending on the bank, this area may also be responsible for check processing or cash control. Here a clerk counts the coupons in each bundle and verifies that the total equals the total shown on the internal

ledger form. The clerk then organizes the coupons into batches or "straps" of 100 by denomination and endorses each coupon. Larger banks use a currency counter that automatically counts, endorses, and straps coupons.

Either daily or every few days, the clerk makes up an internal general ledger slip showing the total amount of coupons represented by all complete and strapped batches as "Due From" the Federal Reserve. The clerk then fills out the Food Coupon Deposit Document and the Federal Reserve Form Cash 31, showing the bank identification and the total dollar value of the coupons. The forms and the batches of coupons are given to a courier for delivery to the Philadelphia Federal Reserve Bank. Partial batches (and complete batches if deliveries are not made daily) are stored in a vault until the next work day.

The Federal Reserve credits the bank's reserve account for the food coupon deposit on the banking day following the banking day of receipt. The banks generally give the grocer credit on the day of the initial deposit. Thus, a bank that processes food coupons daily absorbs one day of "float." The banks that process these items once or twice a week absorb a maximum of four to eight days float. This float represents opportunity costs -- i.e., foregone earnings from investing or loaning the funds -- due to delayed processing of food stamp coupons.

Because food stamps represent a very small percentage of both the "back office" workload and the total deposits of a bank, few banks have made any effort to determine what it costs them for redemption processing. To illustrate the scale of food stamp redemption relative to the overall deposit operations of a typical bank, consider the following data for banks similar in size to those in Reading:¹

A. Average Monthly Food Coupon Volume Redeemed	125,997
B. Average Monthly Volume of Checks Processed	9,304,273
C. Average Monthly Dollar Value of Coupons	\$582,961
D. Average Monthly Dollar Value of Checks	\$11,121,955,771

For these banks, food stamp coupons amount to about one percent of the number of checks processed, and one two-hundredth of a percent of the value.

¹Data based on records from banks involved in previous consulting engagements of Bank Earnings International.

The four Reading banks process volumes of food stamp coupons that range from somewhat more to substantially less than the figures shown above. In July 1984, prior to the demonstration, these four banks handled food coupons with a combined value of \$1,460,500, about three-fourths of which came from outside the demonstration area in Reading. The July 1984 food coupon redemption volume and branch count for the banks interviewed was as follows:

Bank	July 1984 Coupon Value	Total Branches	# of Branches in Reading
American B&T	\$612,900	84	8
Hamilton Bank	599,100	70	7
Nat'l Bank of Boyertown	142,500	11	1
Bank of Pennsylvania	106,000	25	5

LOCAL BANK REDEMPTION COSTS - OPERATIONS

Even though banks do not track their food coupon redemption costs, the evaluation data provide a reasonable estimate of these costs. The first wave of interviews focused on personnel costs (direct and indirect) and transportation costs, which include most of the expenses associated with coupon redemption. Although the banks operate under somewhat different circumstances and with different organizational approaches, it is possible based on the information they provided to derive an average personnel cost. This average is computed by taking the personnel cost per \$1,000 in coupons redeemed for each of the banks and then weighting each of these figures by the banks' coupon volume. This produces a personnel cost figure that represents the average banking expense for each \$1,000 in coupons redeemed in Reading in July of 1984.

On average, the banks reported 0.38 person-hours of teller and clerical time to process \$1,000 worth of food coupons. At the average stated personnel cost (including fringe benefits) of \$7.26 per hour, assuming a 100 percent indirect cost rate, this equates to \$5.52 per \$1,000 worth of coupons redeemed. This figure represents a weighted average across the four banks surveyed. Direct labor costs range from \$2.15 to \$3.44 per \$1,000. The low figure was from a bank outside of Reading, where personnel costs are generally lower. The high figure was from a bank headquartered in a city 50 miles away. This bank has its head tellers count and strap coupons, which results in higher costs per person-hour.

In addition to personnel costs, banks also incur costs for transportation. These costs are small because coupons move through the same courier systems that banks use to move checks and cash between branches and a central site, and between the central site and the Federal Reserve. Based on physical volume, food coupons amount to about 1.3 percent of the average courier transportation load. The average delivery expense is \$16, and the cost per run allocable to food coupons is 21 cents. Coupons are transported twice, from the branch to the central site, and then to the FRB. Because the former happens each working day and the latter every 1½ days in the average Reading bank, the average cost per \$1,000 worth of coupons for these banks (using the July 1984 average coupon volume) is:

$$\frac{\$0.21/\text{run} \times (21 \text{ runs/mo.} + 14 \text{ runs/mo.})}{\$364.9 \text{ thousands/month}} = \$0.02/\$1000 \text{ in benefits}$$

Float is a somewhat more significant cost to banks, particularly those that send coupons to the Federal Reserve Bank only once or twice per week. Float is the opportunity cost that arises when a bank gives credit to a merchant for a food coupon deposit on one day, but does not get credit from the FRB until the next day or some later time. The assumption is that these funds could be invested or loaned at a market rate and earn a return rather than lying dormant as uncollected funds.

Based on a 360-day year and a 10 percent investment rate, \$1,000 of food coupons produce about 28 cents in float for each day they remain uncollected. The four Reading banks have a weighted average of about 1.5 days float. Thus, their float cost per \$1,000 in food coupons is estimated at 42 cents.

Adding the personnel, transportation and float costs gives a weighted average total cost of \$5.96 per \$1,000 of food coupons redeemed across the four Reading banks. Because none of the banks charges merchants for food stamp deposits, this is a net expense to the banks.

REDEMPTION COSTS - ERRORS AND FRAUD

Errors may occur at several points in the coupon redemption work flow. Discussions with the Reading banks indicate that three types of errors have been experienced:

- Discrepancies between the dollar value of coupons deposited by a grocer and the amount credited to the grocer's bank account.
- Discrepancies between the dollar value of coupons sent to the Federal Reserve and the amount credited to the bank's account.
- Discrepancies between the dollar value of coupons sent by a branch to the bank's central processing unit and the dollar value of coupons determined by that unit's count.

Errors of these types are rare and are easily resolved when they occur. Discrepancies at the branch where the bank's total does not equal the grocer's total result in a recount by the bank and a change to the grocer's deposit amount if the grocer was in error. This happens once or twice per month at the typical bank. Less frequent are discrepancies between the branch coupon total and the central processing unit's count. When this occurs, the deposit is sent back to the branch for resolution. The branch usually recounts the items and adjusts the total, but does not change the grocer's deposit amount if the grocer was over-credited. If the grocer was under-credited, credit is given. The difference is accounted for by an administrative adjustment in either case.

Discrepancies between the dollar amount of coupons a bank sends to the FRB and the total determined by the FRB in its count are resolved simply. The FRB recounts to verify that the error exists and then issues the appropriate debit or a credit to the bank's reserve account.

Due to the infrequency of these errors and the relatively simple adjustment mechanisms employed, the cost to the banks is negligible per \$1,000 of coupons redeemed.

7.3 LOCAL BANKS' ROLE IN EBT REDEMPTION

This section examines the banks' role in the EBT system. Because banks have no issuance function in the EBT system, we focus here on the operations associated with the electronic "redemption" of EBT payments.

ORIGINATION OF ACH PAYMENTS

Client purchases made using the EBT system result in electronic credit entries to grocer files. Once each 24-hour period these credits are accumulated in order to effect payment. This occurs during the "bundle-up" process at the EBT Center. All transactions made at a merchant location are combined into one credit entry, to be made to the merchant's bank account through the Automated Clearing House network. A computer program writes the credit entries for merchants onto a magnetic tape in the ACH format. EBT Center staff give this tape to the ACH Control Clerk of American Bank and Trust.

AB&T loads the tape onto a computer and, using its ACH software, edits the file and merges the credit entry records with entries from the bank's other ACH applications. The ACH software produces an output file of entries to go to other banks, and a file of entries to be debited or credited to AB&T customers. The file for other banks is transmitted to the Federal Reserve Bank of Philadelphia. The AB&T file is sent to the AB&T demand deposit accounting system, where credits are made to the accounts of grocers who are AB&T customers.

The ACH process described above is a routine part of AB&T's banking business day. The EBT file given to AB&T is the same as any other ACH input file, such as a payroll file from a local employer. Thus, AB&T's role as ACH originator for the EBT system has only a marginal impact on AB&T's work flow and operating costs.

To AB&T, the two differences between ACH origination for EBT payments and origination for other ACH applications are in settlement and deposit reporting. Settlement for other ACH payments is handled automatically by the Federal Reserve. When the FRB processes an ACH file, it generates appropriate debit and credit entries to the reserve accounts of all payee and payer banks. AB&T balances internally by debiting or crediting the bank account of the firm that submitted the ACH file for origination.

Under the EBT scheme, USDA does not have funds on deposit at AB&T. Therefore, some other means of settlement is required to reimburse AB&T for the funds drawn from AB&T's reserve account when the FRB processes the EBT payment entries plus the amount AB&T credits to its merchants. Thus, AB&T

initiates a wire transfer funds request for this dollar total through the Treasury Financial Communications Systems network to the Federal Reserve Bank of New York. The New York FRB then communicates a funds transfer from the USDA's Treasury account to AB&T's reserve account at the Philadelphia FRB.

The unusual EBT feature pertaining to deposit reporting is that participating merchants, unlike participants in other ACH applications, do not know what is credited to their accounts until their bank statements arrive. Because banks generally send statements monthly, this information is not timely enough for many merchants. AB&T therefore agreed to provide deposit reporting on a daily basis by telephone for several of the local grocery stores. The ACH function at AB&T does not normally include this service.

AB&T ACH ORIGATION COSTS

In September 1985, AB&T conducted a detailed cost analysis of its ACH function. Based on this analysis, we estimate AB&T's cost for originating EBT payments at about 14 cents per payment to a retailer account. This amounts to expenses for AB&T of \$151 per month, or 39 cents per \$1,000 in benefits redeemed. (See Appendix VII-A (p. VII-3) for derivation of these estimates).

AB&T also incurs a cost of \$7.13 for every wire transfer it originates, based on an internal study conducted in January 1985. The daily wires to the Federal Reserve Bank of New York, assuming a 21-banking day month, thus amount to an AB&T expense of \$150 per month, or another 39 cents per \$1,000 in EBT benefits.

AB&T's cost for originating EBT payments, including both ACH and wire transfer activities, is estimated at 78 cents per \$1,000 of EBT benefits redeemed. This understates AB&T's total costs in three respects. First, AB&T incurs costs to strip off and post payment entries for its own merchant accounts before initiating the ACH transmission. We consider this to be equivalent to the costs all participating banks incur to receive payments (the difference being that other banks receive them in an ACH transmission rather than taking them directly from the EBT Center's tape); thus we do not count this as an origination cost for AB&T. Second, AB&T responds to retailers' requests for deposit information, and third, AB&T houses the EBT Center operation. Both activities demand some personnel time, but no estimates of the associated costs are available.

As noted in Chapter 3, the Food Stamp Program pays AB&T a fee for acting as payment originator. The payment is based on a monthly fee of \$5 for each non-AB&T merchant account on the EBT files and \$5.50 per wire transfer request initiated by AB&T. Assuming an average of 83 accounts and 21 wire transfers per month, payments to AB&T amount to \$531 per month, \$1.37 per \$1,000 of benefits redeemed.

RECEIPT AND POSTING OF ACH CREDITS

When the Federal Reserve receives and processes the ACH file transmitted by AB&T, it merges these payment entries with entries from all other banks originating ACH files that day. The processing leads to the settlement of funds exchanged between all payer and payee banks, and the creation of an ACH output file for each bank. Each bank participating in the EBT demonstration thus receives a daily ACH file that includes EBT credits and any other debits or credits initiated by other ACH applications to which the bank is a party.

The output file can be sent to a receiving bank via data transmission or delivered by the FRB check courier on magnetic tape or paper. How and in what form a receiving bank receives its ACH output depends on the processing capabilities of the bank. Banks that receive a transmission or a tape enter the file as input to their ACH software and update customer accounts in an automated fashion. Banks that receive paper listings of the ACH payment entries manually post or key enter the account updates.

The ACH file created by the EBT Center today includes payment entries that are effective tomorrow. There is no banking float in this process: the FRB reserve account debit to AB&T and the credits to payee banks' accounts are effective on the same day that funds are made available to participating merchants through their bank accounts.

Because the EBT ACH payments are included in the FRB ACH output file, along with ACH payments from other sources, there is minimal impact on a receiving bank. An average bank receives several hundred ACH payments each day. Only a few of these payments would have been initiated by the EBT Center. In interviews with Reading bankers concerning the impact of the EBT system, all made the point that the merchant payment process involved no separable action that could be observed or measured.

None of the banks participating in the demonstration charges merchants for their ACH deposits. Most of the bankers interviewed believe that the merchant payment process has such a small marginal impact on their relatively mature ACH operations that it could never be quantified in terms of dollars. For estimation purposes, we assume the receiving bank's cost of handling the deposits is equal to AB&T's cost of originating them (excluding the ACH charges). This amounts to 40 cents per \$1,000 of deposits received.

Cost and compensation figures for both the originating and receiving banks are summarized in Exhibit 7-1. AB&T's compensation exceeds our cost estimate, even when the receiving and posting costs for the bank's own accounts are included. As noted earlier, however, the estimate excludes certain personnel costs for which no data are available.

7.4 LOCAL BANKS' OPINIONS AND PREFERENCES

Every banker interviewed considered the EBT system far superior to the paper coupon system, the important difference being that the EBT approach accomplished all benefit issuance and redemption tasks without the involvement of bank branches. Removing food coupon tasks from the tellers' duties, the respondents said, allows them more time for matters that directly relate to the bank's more central business, thus improving branch effectiveness.

This rationale, when probed, has two underlying bases. First, issuance is considered a problem in branches because it causes long teller lines during issuance periods. The food stamp recipients are not generating business for banks and, in the view of the respondents, are a deterrent to serving the customers a bank wants to serve. For this reason, one of the Reading banks ceased issuing coupons at the first of the year. Citing variations on this theme, three of the four banks interviewed suggested that issuance reduces a bank's ability to maximize the revenue potential of its branches.

The second way that the EBT approach improves branch effectiveness is by reducing operating costs. The bank that elected to discontinue issuance stated that it was able to eliminate one 30 hour/week teller for an annual savings of \$8,580, because of the workload reduction resulting from the elimination of issuance and the EBT-caused reduction in branch coupon redemption. Another bank stated that the demonstration reduced its teller workload asso-

Exhibit 7-1

Operating Costs and Compensation for
Local Banks in the EBT System

<u>Originating bank (AB&T)</u>		
Costs per \$1,000 of EBT benefits		
ACH origination		\$0.39
Wire transfer		0.39
Total		<u>0.78</u>
Compensation per \$1,000		1.37
<u>Receiving bank (AB&T and all others)</u>		
Costs per \$1,000		0.40
Compensation per \$1,000		None

ciated with coupon issuance and redemption by half. These claims cannot be reconciled directly with the banks' cost estimates for coupon issuance and redemption, since teller staffing requirements are a function of both the volume of work that must be accomplished and the arrival pattern of this work. Banks set teller staff levels to accommodate peak workloads at certain times of day and certain days of the month.

While all respondents indicated that improved branch effectiveness was the EBT system's most important advantage to them, each also mentioned that the EBT approach provides cost savings in their central operations area. All of the banks stated that the demonstration reduced the clerical time in the operations area associated with coupon counting, strapping, and shipping to the Federal Reserve.

In general, the respondents found it easiest to explain their preference for the EBT system in terms of eliminating problems with the coupon system. In addition to the preceding notions of eliminating branch traffic and costly paper handling, they mentioned two further benefits. First, processing accuracy would be improved because there is no opportunity to miscount or to misplace coupons. Second, coupons are negotiable instruments that involve a risk of loss (for which the banks are liable) and have to be handled and transported under stringent controls, but this is not necessary in an EBT system where funds piggyback on the established ACH system.

DRAWBACKS TO THE EBT SYSTEM

The bankers interviewed were asked if they saw any major drawbacks of the new system for their banks. None of the four banks' representatives felt that the EBT system had any major drawbacks. One respondent did mention the lack of deposit reporting for merchants, however. This was a problem for the bank because some of its customer merchants call the bank to find out what funds had been deposited via the ACH.

INFLUENCE OF THE EBT SYSTEM ON BANKS' POS PLANS

The interviews asked what plans the Reading banks might have with regard to point-of-sale systems, and to what extent if any, the EBT demonstration influenced these plans. Two of the banks reported plans to participate in a commercial POS system by the fall of 1986; one bank actually

and cancelled are stored in a vault to await destruction. The FRB cash destruction team does a two percent piece count on all coupons to ensure that coupons are not missing. Subsequently, they burn the coupons in an incinerator.

Each day, an accounting clerk fills out Treasury Form 5515 to initiate a debit to USDA's Treasury account for the total dollar value of coupon straps received and credited to banks' reserve accounts. Once each week an administrative clerk assembles all of the Redemption Certificates included with each merchant's deposit and forwarded by banks with the coupons, and attaches them to the Food Coupon Deposit Documents. The Deposit Documents and accompanying Redemption Certificates are then sent to FNS's Minneapolis ADP Field Center.

FRB Coupon Redemption Costs. In an average month, the Federal Reserve Bank of Philadelphia receives about 8 million food coupons amounting to a face value of \$36,200,000. Some 23 people are directly involved in the FRB's redemption processing, including receipt clerks, coupon counters, the coupon destruction team, supervisors, and administrative clerks. These people, in the aggregate, spend an average of 473 hours per week on coupon processing functions. Labor is therefore the major source of expense to the FRB in coupon redemption. Other sources of expense include materials and supplies, equipment, communications, and allocations for the building.

In early 1986, the FRB Philadelphia cost of coupon processing was \$3.47 per thousand coupons. About 90 percent of this figure was for personnel salaries and benefits, 5 percent was for materials and supplies, and the remaining 5 percent was for equipment, communications, and the building allocation. Assuming 1,000 coupons have an average value of \$4,627 (as indicated by the "average bank" data on p.225), the FRB cost per \$1,000 of client benefits was 75 cents.

As noted in Chapter 3, USDA compensates the Federal Reserve for coupon processing and funds transfers by a fixed annual payment. This compensation is paid at a fixed rate of \$12 million annually. The Food Stamp Program issued slightly more than \$10.7 billion in benefits in 1985, so the FRB compensation rate amounts to \$1.12 per \$1,000 in benefits redeemed.

ROLE OF FEDERAL RESERVE IN THE EBT SYSTEM

In the EBT system, the FRB acts as the clearing and settlement agent for payments to grocers that are not customers of American Bank and Trust. The previous section described how AB&T combines EBT payment entries payable to other banks with payment entries generated from its other ACH applications and transmits the resulting file to the FRB each day. The FRB receives this file and enters it for ACH processing along with the files received from other banks. This processing entails merging and sorting entries by payee bank, capturing settlement data, and creating an output file for each payee bank.

Settlement is accomplished by accumulating all debits and credits for each bank represented by the payment entries processed, and entering these totals as debits or credits to the bank's reserve account maintained at the FRB. Thus, EBT payments processed through the ACH result in a series of debits to AB&T's account and offsetting credits to the account of each bank that receives payment on behalf of a merchant participating in the EBT demonstration. Settlement is effected on the day following the day the FRB receives the ACH payment data.

ACH output may be in the form of a paper listing, a magnetic tape, or a file for data transmission. The form of output prepared for any particular bank depends on that bank's desires and capabilities. Physical outputs such as listings or tapes are sent to receiving banks via check couriers, or in the case of remote locations, by mail.

AB&T transmits the ACH file containing EBT payments to the Federal Reserve each business night. The FRB does its processing and output functions the same night and in the early hours of the next morning. Output is made available in the early morning in time to meet courier deadlines. This allows almost all receiving banks to have payment data for their customers by the time the bank opens for business. The receiving bank is required to make funds represented by ACH payment entries available to customers as of the day the bank receives payment information.

ACH Costs to FRB. The Philadelphia FRB processes ACH payments for over 600 financial institutions in the Third Federal Reserve District. In a typical month, the FRB processes about three million ACH payments with a combined value of almost \$10 billion. The ACH is a relatively mature system, having been operational for over ten years.

Because the EBT demonstration utilizes the routine processes of the ACH and generates a relatively small volume of payments, the effect on FRB's ACH activities is virtually unnoticeable. AB&T sends less than 1,000 EBT payments per month through the ACH. This represents 1/3000 of the FRB's ACH volume and a lesser proportion of the dollar value.

No data are available to estimate the marginal impact of the EBT demonstration on the FRB's ACH costs. The most extensive analysis of ACH expenses performed by the Federal Reserve was done in support of FRB pricing of its services. The Federal Reserve is required to charge banks fees which recover all costs and a "private sector adjustment factor" of 15 percent which approximates the profit a private sector service provider would build into its pricing schedule. The fees charged by the FRB for ACH services are:

• Charge for Data Transmission Interconnection	\$60.00/mo.
• Charge Per File on a Tape or in a Transmission	\$ 1.00
• Charge Per Payment in a File (Third District)	\$ 0.01
• Charge Per Payment in a File (Other Districts)	\$ 0.018
• Surcharge Per Payment Originated For Night Cycle Processing	\$ 0.03

The fees most applicable to AB&T-originated EBT payments are the one-cent-per-item charge for third District payments, the three-cent night-cycle surcharge, and the \$1.00 charge per file. AB&T would pay for data interconnect whether or not there were EBT payments, so no incremental cost is assumed here. For analysis purposes, we assume AB&T originates an EBT file as part of its daily ACH work and that the file contains an average of 50 payments with a combined value of \$10,500.¹ The ACH fee would be: \$1.00 + (\$0.04 x 50) = \$3.00. This figure includes a 15 percent "profit" adjustment, so the FRB cost is \$2.55. The cost per \$1,000 in client benefits would then be 24 cents.

The FRB ACH fees described above apply to private sector payments. Banks are not charged a fee for items originated by government agencies. The EBT demonstration is not set up as a government ACH application, however, so AB&T is charged by the FRB for the payments it originates. This ACH fee is included in the AB&T cost figures shown earlier.

¹Assumptions based on interviews with AB&T officials and on the average daily value of grocer payments (from EBT system data).

OPINIONS AND PREFERENCES OF FRB PERSONNEL

Interviews were conducted with FRB officials in the Cash and ACH Departments. Neither group felt that they know enough about the EBT demonstration to provide a valid comparison of this approach against the paper coupon system. In fact, the respondents said that most of what they had learned about the EBT demonstration was a result of the three waves of interviews conducted for this evaluation. They did not notice the demonstration's impact in either the coupon processing function or in the ACH function.

Officials in the Cash Department, where coupons are handled, felt that an EBT system would benefit the Federal Reserve if it eliminated coupons. Coupon processing is labor-intensive, and coupon destruction is a relatively difficult task. The electronic system, as it was described to these individuals, sounded to them like a much more efficient and cost-effective alternative. Their only qualification of this favorable impression was a concern over the security of an electronic system. This concern was general in nature as the interviewees did not know enough about the specifics of the EBT system to pinpoint particular areas of concern.

7.6 CONCLUSIONS

Both commercial banks and the Federal Reserve appear to benefit from an EBT system. Banks can avoid lobby traffic in their branches on issuance days and eliminate most of the expenses they now incur in redemption. The Federal Reserve can get rid of a diversion to its normal operations by eliminating coupon processing and destruction. The ACH capabilities that would replace coupon handling would be affected minimally at either banks or the Federal Reserve.

Total food stamp-related costs in financial institutions are estimated at \$14.42 per \$1,000 of benefits for the ATP/coupon system, or \$1.76 per case month (Exhibit 7-2). Financial institutions' costs in the EBT system decline by over 90 percent, to \$1.18 per \$1,000 or 13 cents per case month.

Some of the costs to commercial banks are uncompensated, and the banks clearly benefit from having them reduced. Banks spend an estimated \$5.96 per \$1,000 to redeem coupons. Comparable costs in the EBT system are estimated at 40 cents per \$1,000.

Exhibit 7-2

**Comparative Summary of Operations Costs and Revenues for
Food Coupon Redemption
And EBT Actions for Reading Banks and Federal Reserve**

	Per \$1,000 of Benefits		
	<u>BANKS</u>	<u>FRB</u>	<u>TOTAL</u>
<u>COUPON SYSTEM</u>			
COUPON COST			
Issuance	\$7.71	-	\$7.71
Redemption	<u>5.96</u>	<u>0.75</u>	<u>6.71</u>
TOTAL	13.67	0.75	14.42
COUPON COMPENSATION			
Issuance	9.91	-	9.91
Redemption	<u>(a)</u>	<u>1.12</u>	<u>1.08</u>
TOTAL	9.91	1.12	10.99
NET COUPON COST	3.76	(0.37)	3.43
<u>EBT SYSTEM</u>			
EBT COST			
Transfer Origination	0.78	0.24	0.78 ^b
Transfer Receipt	<u>0.40</u>	<u>--</u>	<u>0.40</u>
TOTAL	1.18	0.24	1.18
EBT COMPENSATION			
Transfer Origination	1.37	0.28	1.37 ^c
Transfer Receipt	<u>(a)</u>	<u>--</u>	<u>--</u>
NET EBT COST	(0.19)	(0.04)	(0.19)

^aLocal banks are not compensated for coupon redemption and transfer receipt.

^bFRB cost is duplicated in bank cost, because FRB charges banks an ACH fee.

^cUSDA compensated AB&T, which in turn paid FRB. Thus total compensation from external sources is AB&T total. FRB compensation includes 15 percent "profit" adjustment over cost.

The reduction in uncompensated costs is sufficient to make the EBT system advantageous to commercial banks, even though they also lose the compensation they previously received for issuing coupons. Our estimates indicate that issuance fees exceed banks' costs (although some of our respondents believed that costs in fact exceeded the compensation). The EBT system saves the banks \$5.56 per \$1,000 in uncompensated redemption costs, however. Thus, if a bank issues the same amount of coupons that it redeems, the EBT system may reduce its net costs by up to 85 percent.

The financial comparison is not the only consideration leading financial institutions to prefer the EBT system. Indeed, bank representatives spoke very negatively about their issuance role in the ATP/coupon system--despite our estimated surplus of revenues over costs--and unanimously applauded the EBT system simply for eliminating the banks' issuance function.

Both local bankers and FRB officials were at least as concerned about the difficulties and disruptions associated with food stamps as about issues of financial advantage. For both, food stamp redemptions represent a tiny fraction of their normal business. EBT activities resemble normal operations more closely than coupon redemption procedures. Moreover, the EBT system puts automated procedures in place of labor-intensive activities, consistent with the general direction that financial institutions are taking.

For these various reasons, it can be expected that the banking industry as a whole would enthusiastically support future applications of the EBT concept.

Chapter Eight

THE RELATIONSHIP BETWEEN EBT SYSTEMS AND ELECTRONIC FUNDS TRANSFER NETWORKS

Point-of-sale (POS) systems--systems that make payments by means of an electronic debit to the purchaser's bank account and a corresponding electronic credit to the merchant's bank account--are relatively new. Tested and analyzed within the banking industry since the early 1970s, only recently have POS systems been implemented in sufficient numbers and on a large enough scale to be considered a lasting reality. Although many issues are still unresolved, particularly in regard to the economics of POS, the service has reached a state of acceptance that makes it almost certain to become an integral part of the nation's payment mechanism.

Because POS systems will include many of the supermarkets and convenience stores that handle food stamps, plans for future EBT systems will have to consider whether and how the EBT and POS systems will interact. This is partly an efficiency issue: integration with POS systems may be needed to bring EBT operating costs into an acceptable range, as illustrated in Chapter 3. Moreover, grocer and banker support for an EBT system could depend on the way an EBT system fits existing or planned POS systems.

Because no POS systems were operating in Reading at the time of the demonstration, this chapter relies on information and judgment from POS systems that have been implemented in other parts of the country. The first part of the chapter presents a brief description of POS systems as they have developed thus far, and some changes likely to occur over the next several years. The remainder of the chapter considers the relationship of EBT and POS systems. It examines the implications of starting up EBT systems in the three general types of POS environments that are likely to be found across the country.

8.1 POS SYSTEM CHARACTERISTICS

The typical commercial POS system is basically a larger version of the EBT system tested in Reading. It has a number of terminals deployed at checkout lines in merchant locations, with the terminals linked via encrypted

data communications to a central computer and consumer cards that activate the system. Like the EBT system, it uses on-line communication from the merchant's terminal to the central computer to authorize purchases. (Off-line approaches, with authorization based on the customer card, are being tested but currently are not common.) A typical POS system, however, includes many more participants than the EBT demonstration, and it is correspondingly more complex in its organization and operation.

The cards that activate a POS system are generally issued by participating banks to their customers. These cards, called debit cards, are used for purchase transactions that result in debits to a bank customer's account, thus functioning like personal checks. Each participating bank signs up customers for the service, and issues each customer a card and a Personal Identification Number. Purchases made with these cards are electronically routed to the bank for authorization and for computer posting to the cardholder's accounts.

The terminals used in POS systems include both stand-alone devices designed for POS, as in Reading, and modified electronic cash registers. The merchant's bank usually solicits the merchant's participation in the service, helps with terminal selection and network interface, and receives the merchant's electronic credit payments resulting from POS purchases.

The POS network consists of leased or dial-up communication links between a central "switching" computer and each participating bank and merchant location. The central switching computer routes transactions from terminals to those banks with on-line connection capabilities, or authorizes transactions and captures data for banks that are not on-line. In some cases, banks have direct connections to their merchant's terminals, and they route authorizations initiated on other bank's cards to the network switch.

ORGANIZATION OF POS SYSTEMS

The above elements of a POS system are organized under the umbrella of a central group, typically composed of representatives of participating banks. The central group sets the standards for cards, terminal protocol, settlement of funds, interchange fees, and other aspects of system operations that affect more than a single participant. The actual operation of the

central switch is ordinarily contracted out to one of the participating banks or to a data processing firm.

Settlement between the merchant and cardholder banks varies among POS systems. In one approach, transaction data are captured and Automated Clearing House payments are created to effect overnight settlement. In other systems, all participating banks maintain accounts at one lead bank for the network and all transactions create immediate debits and credits to these accounts. A third approach is for the network to accumulate totals for each participating bank that represent the net amount of debits and credits due to POS transactions between that bank and each other participating bank. At the end of the day, each bank then settles with every other bank by wire transfers or through entries made to their accounts at the Federal Reserve.

FINANCIAL ARRANGEMENTS

Because individual banks bring the merchants and cardholders into the POS system, there are no common bases for pricing. Each bank packages and sells POS to its customers as it sees fit. Banks generally do not charge consumers for their cards, and often not for POS transactions. Because POS is a service that has not yet had much consumer demand, many banks feel that offering it for free is the only way to build an adequate cardholder base.

Merchant pricing for both terminals and transactions is a different story. Banks deal with each merchant, particularly larger chains, individually. In some cases the merchant rents the terminal at a low rate from the bank and pays a transaction fee. In other instances, the merchant owns the terminals and the bank pays the merchant a transaction fee. The wide variations in merchant pricing that may be found today underscore the uncertainty about the economics of POS. There are many differing views as to who benefits from POS and to what extent, and correspondingly different views about who should pay for the services.

Transactions that flow through the POS network incur a per-item fee to be paid by either the cardholder's or the merchant's bank. This fee covers the cost of operating the network, and is paid to the network operator. In some cases a portion of the fee goes to the POS system administrator to cover marketing and support costs. In other instances a portion of the fee is passed on to the cardholder bank or merchant bank. Start-up costs and often

part of the ongoing operating costs are paid by the POS system organizers, usually a group of banks. Terminal owners bear the communications costs, except for the portion of a network that involves links between the switching center and terminal concentrators (intermediate computer centers that funnel transactions to the central switch).

8.2 KEY POS ACTORS' ATTITUDES TOWARD EBT SYSTEMS

Merchants, banks, and system operators are the primary actors in a POS system. Each has different objectives and concerns that will shape their attitudes toward EBT systems. The most important factors influencing these attitudes are described below.

RETAIL FOOD INDUSTRY OUTLOOK

The retail food business relies almost exclusively on cash and checks as means of payment. Most purchases are made with cash--60 to 95 percent, depending on the type of store. Because checks tend to be written for larger purchases, however, checks account for over half of the dollar value of sales in most large stores.

To the extent that POS transactions replace cash and check transactions, the service could affect numerous aspects of the retail food business. These effects differ by the type of store, so one would expect attitudes toward POS to vary by store type. For current purposes we will examine two major classifications of food retailers: supermarkets and convenience stores. Earlier chapters included small and medium-sized grocery and specialty food stores as a third major type of establishment participating in the Food Stamp Program. In general, industry analysts expect these stores to adopt POS more slowly than supermarkets and convenience stores because of their small scale. As a result, little information is available concerning these stores' opinions of POS, and they are not included in the discussion here. (As indicated in Chapter 5, these stores were somewhat less enthusiastic than supermarkets and convenience stores in their opinions of the EBT system.)

Supermarkets have been central to POS planning since its inception because of their high volume of transactions. A 1985 study¹ sought to determine the position of leading retail organizations, including supermarkets, toward their involvement in POS systems. Exhibit 8-1 summarizes the conclusions of the study. From this and other studies, it is apparent that supermarkets want POS to reduce their operating costs, but they are not optimistic about achieving such benefits for many years. Consumer acceptance of POS is the key to supermarket involvement in POS. As greater numbers of consumers respond to the convenience of debit-card shopping and look for that feature in stores, supermarkets are expected to move quickly to offer the service.

Convenience stores operate on higher margins than supermarkets and are motivated to maximize the volume of store traffic. The POS study's conclusions about the opinions of convenience store chains, shown in Exhibit 8-2, suggest that these chains look to POS as a way to increase revenues. Again, however, the expectations for POS to have an impact in the near future are not great. Convenience stores expect consumer acceptance to build slowly through POS programs involving supermarkets and gas stations before it begins to benefit them.

Food retailers are generally favorable toward POS and see it as a central part of future payment systems. Because consumer acceptance is the key to the success of POS, these retailers are likely to support any program that creates public awareness of, and interest in, point-of-sale systems. An EBT system is likely to be viewed in this manner. It not only provides immediate benefits by eliminating burdensome food coupons, but it is a highly visible form of POS that can help to make the general public aware of the ways that POS might offer personal convenience.

NETWORK OPERATOR OUTLOOK

The operators of POS networks have relatively high fixed costs resulting from computer and communications equipment leases. The bulk of their revenues come from fees charged on a per transaction basis. Thus, volume growth is critical to the economic viability of a POS operator.

¹ Madison Consulting Group, El Segundo, California, "POS Debit Card Positions of Major Retail Organizations", March 1985.

Exhibit 8-1

POS Positions Within the Supermarket Chain Industry

The industry is divided on the issue of whether debit card acceptance provides a competitive advantage. However, all major supermarket chains would agree that a competitive advantage will occur only if a substantial portion of consumers believe that using a debit card to buy groceries provides real convenience.

Unless accepting the debit card provides a distinct competitive advantage, supermarkets concede that it is not likely to increase sales.

Supermarkets look for payoff from the debit card primarily in the area of cost reduction, if a sufficient number of customers use debit cards.

- They believe that the debit card has the potential to speed up the check-out process when use of the card displaces a check transaction. The opportunity to convert faster check-out to labor cost reduction, however depends on the percentage of check transactions converted to cards. If customer use is low, labor cost displacement may not be possible.
- Supermarkets also expect cost displacement from a reduction in the number of checks handled. Benefits are expected in the form of lower bank fees and faster availability of funds. Reduction in bad check losses is generally considered to be unlikely.

Supermarkets are quite concerned about the cost of equipping all stores to accept debit cards, with costs estimated at \$10,000 to \$20,000 per store.

- Many supermarkets do not have the capability to handle plastic card transactions. Consequently, they will need to add card readers and PIN-pads to all check-out lanes to minimize the time required to do a debit card transaction.
- Most supermarkets expect that they would bear the cost of this equipment.

While supermarkets would like to charge transaction fees to banks to recover their capital investment and incremental operating costs, they also concede that getting such fees from banks is, in the long run, not too likely.

Most major supermarket chains are involved in POS pilot tests. At this point, only a very few have made a serious commitment to convert all stores to the system. The crucial unknown is the importance the customer will assign to the opportunity to use a debit card and, therefore, the extent, if any, of the competitive advantage and cost displacement potential of the service.

Volume growth comes from merchant and consumer acceptance of POS. Most networks first try to enlist as many merchants as possible, under the assumption that consumers need to see that POS is widely available before they will accept it. The network's problem is to sell POS to merchants, who want evidence of consumer demand before they agree to participate.

This "chicken and egg" situation actually favors network operators' acceptance of EBT programs, as long as the EBT program does not compete with the network (e.g., by placing terminals not compatible with the network in stores). The networks will be able to use the EBT program as validation of the POS concept in discussions with food merchants, a group of retailers who are important to the spread of POS. Food merchants can be promised an immediate and reasonably large base of cardholders and the attractive prospect of eliminating food stamp coupons.

BANK OUTLOOK

Bank participants in POS can be divided into three groups, based on the way they decide to become involved in this service. The first group, usually including the largest banks, are the owners/organizers of the POS network. Although these banks share the interests of other bank participants, their dominant view is that of network operators.

The second group of banks intend to sell POS to their merchant customers. These banks expect to generate revenues from either or both of two sources, depending on how network pricing is structured: transaction fees the

Exhibit 8-2

POS Positions Within the Convenience Store Chain Industry

Convenience store chains perceive that accepting a debit card could be a competitive advantage, particularly since many of their stores also have gas pumps and can attract customers by offering the cash price on a plastic card transaction. Accepting debit cards at the point-of-sale also supports their strategy to install Automated Teller Machines as a traffic-building device.

Because of the perceived competitive advantage of accepting debit cards, convenience stores believe that it will increase sales as a result of both increasing the number of customers and increasing the amount of the average sale.

- Because most convenience store sales are for cash and tend to have a low average value, the stores are especially attracted by the possibility that consumers will make larger purchases with the debit card.
- Also, because of high margins on merchandise and relatively fixed costs for staffing the store, additional sales can significantly increase store profitability.

Convenience stores typically use relatively unsophisticated cash registers at the point-of-sale. As a result, acceptance of debit cards will require the installation of stand-alone debit card terminals with a dial-up link to the network. Such equipment is expected to cost about \$1,200 to \$1,400 per store and is not considered to be a serious impediment to getting into the debit card business.

Convenience stores do not expect to receive transaction fee revenues from banks for the debit card transactions they generate.

Convenience stores, because of their gasoline sales business, share some of the motivations of the oil companies to accept debit cards. Also, because of high profit margins and relatively fixed store operating costs, convenience stores are interested in ways to increase store traffic and sales. In conjunction with the relatively low cost for equipping stores to accept debit cards, these incentives have encouraged the chains to participate in extensive pilot programs. However, convenience stores recognize that consumer acceptance and use of the debit card probably depends heavily on widespread acceptance of the card by other retailing segments such as supermarkets, department stores and the general merchandise chains.

chants. Thus, these banks also are likely to support an EBT program. Because EBT benefits for them are more indirect, however, their support may be correspondingly less strong.

8.3 POS ENVIRONMENTS

POS has not developed in a uniform manner nationally. Wide variations in shape and status of POS can be found among states and even within many states. The environment that EBT systems will face thus ranges from areas with no POS and no plans for POS, to areas where all major merchants and banks participate in one relatively well-developed system. The approach in EBT planning will necessarily have to adapt to these differing POS environments.

For present purposes, we will classify a geographic location's POS environment in one of the following three broad ways: no systems; emerging systems; and established, maturing systems. Each category represents a unique situation, each with its own obstacles and opportunities for EBT programs.

In any environment, EBT planners face four general issues:

- Division of responsibilities -- how each EBT function will most effectively be handled within the environment (card issuance, network communications, funds flow, file maintenance, etc)
- Allocation of costs -- what EBT costs will be borne by the Food Stamp Program and what costs will be borne by the other POS participants
- Terminal deployment -- the Food Stamp Program may involve grocers that are not POS participants, and this may necessitate a special EBT terminal deployment capability
- Control -- to what extent can the Food Stamp Program govern access to client files, ensure adequate security, set specifications for the EBT service, etc.

LOCATIONS WITH NO POS

The Reading demonstration was implemented in a location with no POS systems, although POS was operating in other parts of the state. This meant that the EBT system had to be designed to accomplish all functions and bear all costs. A similar approach would be required to implement an EBT system in any locale where POS was neither operational nor planned.

This represents the base against which the environments with POS activity can be compared. Here, the EBT system must stand alone, while in an environment with POS there can be a sharing of functions and costs. Because the EBT system stands alone, however, this environment affords the greatest control to program administrators.

The areas with few or no POS systems are likely to be the less populated states such as Montana, Wyoming, and Alaska. EBT costs would be high on a per client basis in these situations because of the small number of clients, the large geographic area to be covered, and the lack of major population centers. It is for these same reasons that POS is not likely to be pursued by the private sector.

EBT IN AN ESTABLISHED POS ENVIRONMENT

An established POS environment has one or more large established, operational POS networks. The systems need not be "mature" in the sense that their merchant and cardholder base has leveled off. In fact, it is appropriate to assume considerable growth and change in the systems, even in "established" environments.

Grocery stores will almost certainly refuse to have two different kinds of POS terminals in a store, much less two at a checkout line. Because private sector POS potentially involves more customers and a far greater proportion of sales than an EBT system, the EBT program will be pressured to become part of the POS system. If the same terminal is used for both POS and EBT transactions, it will be most efficient for it to be tied into only one network. Although a POS terminal can dial up different networks, this capability is likely to increase costs and complicate the tasks for grocery clerks. Also, because long distance dialing or local terminal concentration points are needed in a statewide network, putting all transactions on one network should yield lower communications costs.

With one network, EBT transactions will have to pass through the POS switch. From that point on there are several options for authorization, data capture, funds flow, and terminal deployment.

EBT card issuance is most likely to be handled by a state agency, as it was in Reading. The State must still perform the certification function,

and it is natural to append card issuance to this function. Moreover, the training and control aspects of card issuance are important and are not likely to be as effective if banks or other parties assume the task. Even so, the EBT cards will have to meet the technical specifications of the POS system.

Maintenance of client files can be handled by the State, the POS switch, or a bank. If the State performs this function, it can achieve greater control and possibly incur lower costs than if this function is contracted out. The State in this scenario would be an on-line participant in the POS network. EBT transactions would be routed by the POS switch to the State's computer center for authorization and data capture.

To credit grocers for food stamp benefits accepted, the State or U.S. Department of Agriculture (USDA) would probably need to have funds on account at the bank used for settlement of the POS system. If a State used its own bank account for settlement, it would have to be reimbursed by means of a wire transfer (as AB&T was reimbursed in Reading) or through the Automated Clearing House.

The State will have to pay for use of the POS network. This cost would be on a per-transaction basis; it would not likely be more than 15¢ initially, and it would drop as POS volume grew. Part of this fee would be retained by the network and the remainder would be passed to merchants and/or their banks as compensation for use of their equipment for EBT purposes.

Any terminals sponsored directly by the State--i.e., to include grocers not participating in the POS system--would represent a separate expense. These would probably be small grocers who do not join the POS system because they anticipate insufficient volume to justify the costs. For similar reasons, some of these grocers might be unwilling to bear the cost of acquiring a terminal to accept food stamp benefits. The State would then have to decide whether or not to bear some or all of cost of these terminals; the State's decision might depend on whether the stores are considered important to recipients' ability to use their benefits.

While expenses would be less in this scenario, EBT administrators would have a limited ability to influence the structure or operation of the POS system. An existing POS system has standards and an operating scheme that are entrenched for the most part, and participants would be reluctant to

change to accommodate the EBT system. Nevertheless, they would be very eager to have the EBT program overlay the POS system. EBT volume would help the network achieve the economies of scale that POS participants seek, and it would raise the visibility of the POS service, which should boost consumer acceptance.

Because of the close similarity between an EBT transaction and a POS electronic debit transaction it is likely that an EBT program could overlay almost any existing POS system and function quite well. Several potential differences may arise in transaction procedures, however. For example, the POS card may not have the cardholder's picture, and clerks may not take any steps to verify that the person presenting the card is the cardholder. The PIN, which may be desired as a security feature for EBT purposes, is still debated for POS systems (for instance, the major POS system currently operating in Arizona does not use the PIN). Moreover, an EBT system requires a check of the recipient's current balance, while most POS systems check the purchase request against a daily limit.

Such differences between the EBT scheme demonstrated in Reading and the approach used by an existing POS system might result in somewhat higher levels of fraud and abuse. However, the ability of the POS system to block stolen or lost cards from use should limit this exposure. No quantitative information is available for judging the impact of not using PINs or client pictures.

On the whole, this is a far more attractive environment for EBT than the environment where POS does not exist. The program would be greeted with enthusiasm by administrators of the POS systems, it could be implemented relatively quickly, and the cost per client should be less than that in other environments. Arizona, California, Florida, Iowa, and Pennsylvania are examples of states with established POS systems.

EBT IN AN EMERGING POS ENVIRONMENT

Most EBT planners in the near future will face a situation where POS is in the planning or limited testing stage. Here, the EBT system will be viewed by POS organizers as an opportunity to move the POS concept forward. This would give EBT planners a great deal of leverage in designing the combined EBT/POS system, but it would also mean that the EBT program would be

expected to underwrite a portion of the system development and implementation costs.

The EBT program would be able to determine its own role in the POS system. Issues and procedures such as the use of PINs, terminal functions, funds flow, back-up, and security would be decided in a manner that made every effort to accommodate the interests of the EBT program. In this situation, the state food stamp agency would probably maintain client files, issue its own cards, and participate in EBT transactions through a communications link to the network switch. Funds could flow in any manner appropriate to the State, not necessarily by the same method used for other POS transactions. For example, EBT transactions could be cleared through the ACH overnight, while POS transactions were handled by an inter-bank settlement process.

The EBT program would likely be a key vehicle for gaining food merchant participation in the POS system. Grocers might expect more immediate benefits from the elimination of food coupons than from the change to POS transactions from cash and checks, because though coupons represent a relatively small percentage of sales, they are perceived to be cumbersome to deal with. The results of the Reading demonstration support this notion: grocers did not achieve significant cost savings from the EBT program, but they showed enthusiastic support for the EBT concept.

If grocer support for EBT is as high in other locales as it was in Reading when the concept was introduced, EBT administrators should find that they have leverage in dealing with banks and grocers on terminal deployment. The EBT program could ensure that food stamp recipients would be able to make food purchases at a sufficient number of locations, without the program having to fund many terminals that might not be installed for POS purposes alone. In this regard, the EBT program might achieve full terminal coverage at lower cost than when coming into a mature POS environment.

Costs other than those associated with terminal deployment would likely fall somewhere between the levels of the other two POS environments. The EBT program would have to share in development cost to some extent, and the operating costs of a new POS system are typically higher on a per transaction basis than those in a more mature system. Over time, however, the ongoing EBT cost should be about the same as that where the EBT system enters a mature POS environment.

This is possibly the best environment for EBT development. EBT planners can make sure that the EBT/POS marriage meets the needs of the Food Stamp Program, and cost savings can be achieved relative to a situation where there is no opportunity to piggyback on a POS network. Today, Georgia, Minnesota, North Carolina, and Tennessee are examples of states where POS is in the developmental stages.

8.4 CONCLUSIONS

If the EBT concept is to be widely applied, decisions about EBT relationships with point-of-sale systems will play a vital role. EBT and POS systems both need terminals on grocers' checkout counters. Having a single terminal serve both purposes may be not only the most efficient solution, but perhaps the only solution acceptable to all parties. Integration with POS systems also may be a means to attain economies of scale in EBT systems, and thereby to attain administrative costs comparable to those in the ATP/coupon system.

For most POS systems, even those that are operationally "mature," increases in the volume of purchase transactions are critical to long-term survival. Increased volume depends on merchants making the service available to their customers, and on the customers wanting to use it. Integrating an EBT system into a POS system brings additional transaction volume and new merchants to the POS system and may, by making the service more visible, increase customer demand. All parties to the POS system can therefore be expected to warmly receive the notion of integrating an EBT system.

The relationship of an EBT system to POS systems will vary depending on the maturity of the existing POS systems. In locations with little or no current or planned POS activity, an EBT system has to be operated on a stand-alone basis, as in Reading. However, the characteristics of these areas that inhibit POS growth may also make EBT an unfeasible alternative to the coupon system. Where mature POS systems exist, it will generally be desirable for the Food Stamp Program to have those systems perform some EBT functions (at a minimum, accepting transactions at stores in the system and routing them to the state food stamp agency for authorization). Where POS systems are currently under development, EBT planners can take a major role in system design to gain an optimal allocation of functions and costs between the State

and the POS network, probably in return for sharing system development costs. In both the mature and the developing POS environments, it is likely that EBT/POS integration could benefit both the POS system and the Food Stamp Program.

APPENDIX I

APPENDIX I-A

OTHER REPORTS FROM THE EVALUATION OF THE EBT DEMONSTRATION

John A Kirlin, Developing an Electronic Benefit Transfer System for the Food Stamp Program, Cambridge, Massachusetts: Abt Associates Inc., August 1985.

John A. Kirlin and William L. Hamilton, Performance Issues in an Electronic Benefit Transfer System for the Food Stamp Program, Cambridge, Massachusetts: Abt Associates Inc., February 1987.

Susan H. Bartlett and Margaret M. Hart, Food Stamp Recipients' Patterns of Benefit Redemption, Cambridge, MA: Abt Associates Inc., May 1987.

APPENDIX I-B

GLOSSARY

AB&T	American Bank and Trust Company. Reading bank which receives retailer deposit information and initiates funds transfer requests for the EBT system through the Federal Reserve system.
ACH	Automated Clearing House. Financial network used to process funds transfer requests.
ATP	Authorization-to-Participate card. Card used in some jurisdictions to authorize delivery of food stamp coupons to program recipients.
BCAO	Berks County Assistance Office. The local welfare office serving the Reading area.
BIC	Benefit Identification Card. Photo identification card with encoded magnetic stripe used to gain access to benefits in the EBT system.
BTT	Benefit Transaction Terminal. Equipment located at retail check-out counters to read recipients' BICs and to transmit transaction information to the EBT Center. Also referred to as Benefit Transfer Terminal.
EBT	Electronic Benefit Transfer. The EBT system uses electronic funds transfer and point-of-sale technologies for the delivery and control of food stamp benefits.
EBT Center	Local operations center for the Reading EBT system.
EFT	Electronic Funds Transfer.
FNS	Food and Nutrition Service. Federal agency within the United States Department of Agriculture responsible for administering the Food Stamp Program.
MARO	Mid-Atlantic Regional Office. Regional office of FNS serving the Reading area.
NACHA	National Automated Clearing House Association. All electronic funds transfer requests need to be transmitted in a standard format adopted by this association.
OGC	Office of the General Counsel of the United States Department of Agriculture.
OIG	Office of the Inspector General of the United States Department of Agriculture.

PDPW Pennsylvania Department of Public Welfare. State agency responsible for administering Food Stamp Program operations.

PIN Personal Identification Number. A four-digit code selected by the recipient. This code must be entered on the PIN-pad attached to the BTT before any purchase transaction will be processed in the EBT system. Also required for balance inquiries.

PIN offset A special number that is based on the recipient's BIC number and PIN. For security reasons, the offset, rather than the PIN itself, is encoded on the card.

POS Point-of-Sale. Refers to equipment and systems that electronically debit clients' accounts and credit retailers' accounts as a sale is performed.

PRC Planning Research Corporation. Contractor selected to design, develop, and implement the Reading EBT system.

TAC Transaction Authorization Code. A number computed and transmitted by a store BTT for each electronic purchase and refund transaction. The number is based on the data being transmitted. The system's computers, upon receipt of transaction data, recompute the TAC. If the transmitted data have been degraded during transmission, the two TACs will not match and the transmitted data will not be processed.

USDA United States Department of Agriculture.

APPENDIX III

APPENDIX III-A

DATA SOURCES AND METHODS

The data for analyzing the administrative costs of the ATP and EBT issuance systems were drawn from interviews, administrative reports, and time studies. The data were collected in three waves. The first wave occurred in August and September of 1984, preceding the start-up of demonstration operations, in order to obtain baseline cost measures against which the effects of the EBT system could be measured. The second wave, conducted in April 1985, measured the cost of the EBT system two months after the full recipient caseload had been brought into the system, and obtained comparison data on changes in the cost of the ATP/coupon system. The final wave, in the fall of 1985, collected data on a more stable EBT system and final estimates of ATP/coupon system costs. Some additional data were collected in early 1986 to complete the cost estimates, especially with respect to national-level functions within FNS.

ATP SYSTEM DATA COLLECTION

The primary sources of data on ATP/coupon system costs were interviews and time studies, although some data came from reports and other documents provided by FNS and the Pennsylvania Department of Public Welfare. Interviews were conducted with representatives of the following units:

Federal Agencies:

- Compliance Branch, FNS
- Coupon Production and Supply Unit, FNS
- Program Accountability Division, FNS
- Program Development Division, FNS
- Program Information Division, FNS
- Information Resource Management Division, FNS
- Minneapolis Field ADP Center
- Accounting Division, FNS
- Administrative Review Division, FNS
- Mid-Atlantic Regional Office, FNS, and
- Philadelphia Field Office, FNS.

Pennsylvania Department of Public Welfare:

- Office of Information Systems
- Bureau of Food Stamp Administrative Services
- Comptroller's Office
- Division of Management Consulting Services
- Mailroom, and
- Berks County Assistance Office (BCAO)

During these interviews, respondents were asked to describe the process by which tasks related to issuance or redemption were accomplished, what staff and other resources were used, and how much time and other costs were required. Staff salary and fringe benefit data also were obtained.

For PDPW, the cost data were supplemented by the quarterly cost reports to FNS (form FNS-269) for Fiscal Year 1984 and Fiscal Year 1985, along with sample worksheets used by PDPW in completing the FNS-269. Special compilations of issuance costs from accounting records were obtained from the PDPW Office of Information Systems and the FNS Minneapolis ADP Field Center.

The primary data source on the administrative costs of the local food stamp agency (BCAO) functions in the ATP/coupon system was a series of time studies of caseworkers and clerical staff. During each of the three waves of data collection, BCAO caseworkers with involvement in issuance functions and all clerical staff completed daily time logs for approximately 20 working days. These logs were designed to record all time spent on issuance-related activities by function; during Early and Late Demonstration, the logs separated issuance-related time for the EBT system and the ATP/coupon system.

EBT SYSTEM DATA COLLECTION

Data on EBT system costs came principally from the reports submitted by PRC, the demonstration contractor. At the end of each phase of the project (design, development, and implementation), PRC submitted to FNS a summary of costs by task and by line item. Data from PRC invoices and other FNS materials on PRC contract costs also were used.

Interviews described above also provided information from FNS, PDPW, and BCAO on the cost of designing, developing, implementing, and operating the

remained in the ATP system. The major changes were in PDPW costs for coupon ordering, delivery, and reconciliation, which are uniform across the state.

The major exception to the use of Late Demonstration data is in the BCAO time study estimates for ATP costs. The August 1984 (Pre-Demonstration) time study data indicated that the demonstration area had a higher cost per case month than the non-demonstration area for functions related to lost, delayed and stolen ATPs. This analysis suggested that the Pre-Demonstration estimate for the demonstration area would be a more appropriate measure of the cost of these functions for the demonstration area in the absence of the EBT system.

This measure was reduced by 7.7 percent, in proportion to the change in the cost per case month for these functions in the non-demonstration area from August 1984 to October 1985. It was assumed that the change in cost was due to factors that would have had the same effect on the demonstration area, such as improvements in the accuracy of address data.

Indirect cost factors were estimated for PDPW, BCAO and FNS to account for the resources that could not be directly measured but were nonetheless necessary to the performance of ATP and EBT functions. These costs include supervision, administration, and non-personnel costs (office equipment, telephones, supplies etc.)

The general method began with identification of those costs that are not clearly attributable to any one function of the Food Stamp Program or other assistance programs. The total pool of direct costs to which these indirect costs apply was then determined. Supervision costs were allocated only to labor; where possible, the number of full-time equivalent (FTE) staff was used as the denominator for the supervision cost factor. Non-personnel costs were also allocated solely to labor on a per-FTE basis where possible. (The specific estimates for indirect cost factors are discussed in Appendix III-C.)

In the analysis of the BCAO time study data, the emphasis was on the estimation of the total cost of issuance-related functions under the ATP and EBT systems. The caseworker logs did not provide any data on other tasks, and the level of detail in the clerical logs did not permit comparative analysis of issuance-related time versus time spent on other tasks. Thus, it was not

possible to allocate idle time between issuance and other work. Adjustments were made, however, to account for training periods in which workers spent substantial time on activities that were neither issuance-related nor part of other routine functions.

Caseworker costs were computed by summing the time spent in each wave by activity and then applying an average wage (including fringe) to calculate total cost. Because of the greater variation in clerical salaries, the cost of each episode of activity was calculated separately, using the average salary for the worker's job class. These "episode costs" were then summed by activity and organized into the functional framework presented in Section 3.2. The caseworker and clerical costs were adjusted for missing data, and the indirect cost rate was applied to the final totals.

Another major adjustment made was to remove ongoing development costs from the PRC operating costs presented in Section 3.2. The EBT Center and PRC headquarters labor costs in this section are averages from invoices for August through October 1985, the "steady-state" period for the EBT system. The level of effort reported on these invoices corresponded closely with the labor reported in the October EBT Center time study and PRC's estimate of the "normal" level of effort required for management and technical support (provided in the Late Demonstration interview).

The estimation of demonstration biases in the EBT cost and future system costs proceeded in three stages. First, the reported cost for EBT operations in the extended demonstration was combined with other data to estimate the savings from eliminating staff slack time and the extra cost of leasing equipment. Second, estimates were compiled for larger independent EBT systems to test the economies of scale. Finally, costs were estimated for "piggy-back" EBT systems, to explore the effect of sharing facilities with commercial POS systems. (These estimates are explained in detail in Appendix III-F.)

The speculative nature of these simulations made it inappropriate to compare them directly with the actual cost of the ATP/coupon system. The simulations do, however, provide the means for establishing the critical variables to determine whether an EBT system can be comparable in cost per case month to the ATP/coupon system.

APPENDIX III-B

DETAILED PRC COSTS FOR EBT SYSTEM DESIGN, DEVELOPMENT, AND IMPLEMENTATION

This appendix presents detailed data on PRC costs for the design, development, and implementation phases of the EBT demonstration. Data presented include breakdowns of cost by task and line item and distribution of labor hours by PRC labor category. The procedure used to estimate PRC implementation cost is explained.

Exhibit III-B1 shows the distribution of PRC line-item costs by task for the design phase. Program management (which included system engineering) accounted for 74 percent of all costs on this phase. Training development was the other large category, with 14 percent of all costs. The largest direct cost, aside from labor, was travel (\$3,869), most of which was for system development functions. Nearly all of the \$2,200 for consultants was spent on user interface, primarily for recruiting retailers.

Exhibit III-B2 presents the distribution of the \$1,076,013 spent by PRC on developing the EBT system. Labor was the primary cost during the development phase, although PRC incurred \$92,229 in other direct costs, including computer leases and other equipment costs. Nearly 80 percent of all costs were spent on system development. Other tasks with notable expenses were project management (10 percent of Phase II costs) and training development (9 percent).

The distribution of PRC's effort among levels of personnel shown in Exhibit III-B3 reflects the shifting emphasis of the project as it moved from the initial design phase into operation. In Phase I, nearly half of the labor time of 5,929 hours was spent by senior scientists, senior programmer analysts, and the project director. The center of effort moved to the middle levels of staff during the development phase, when programmer analysts, associate programmer analysts, and associate systems analysts accounted for 56 percent of the hours. The wide spread of labor hours during the early part of Phase III reflects the combination of upper-level effort in directing and monitoring implementation, together with the first substantial amount of

Exhibit III-B1

PRC Phase I Costs: Totals by Category and Distribution by Activity

EXPENSE CATEGORY	TOTAL COST	SYSTEM DEVELOPMENT (% OF TOTAL)	TRAINING DEVELOPMENT (% OF TOTAL)	TESTING AND EVALUATION (% OF TOTAL)	PROGRAM MANAGEMENT ^a (% OF TOTAL)	SITE ACTIVATION (% OF TOTAL)	USER INTERFACE (% OF TOTAL)
Labor and Overhead	\$225,978	2.3%	14.2%	6.5%	77.1%	0%	0%
Travel	3,869	80.6	0	0	0	6.6	12.7
Consultants	2,200	0	3.2	0	0	0	96.8
Reproduction	3,314	98.7	0.1	0	1.2	0	0
Other Direct Costs	1,207	24.9	0.3	0.1	74.7	0	0
General and Admin. ^b	<u>20,141</u>	<u>*</u>	<u>*</u>	<u>*</u>	<u>*</u>	<u>*</u>	<u>*</u>
Total Cost/Percent of Cost	256,709	4.6	13.6	6.3	74.2	0.1	1.1

^aProgram management activity included system engineering (85% of total days for activity).

^bNo breakdown for general and administrative costs available by activity.

Source: PRC Cost Summaries.

Note: Total costs by category in this table are drawn from PRC final cost report. These estimates are assumed to be more accurate than original PRC summary of Phase I costs, which provides slightly different data.

Exhibit III-B2

PRC Phase II Costs by Category and Distribution by Activity

CATEGORY	TOTAL COST	SYSTEM DEVELOPMENT (% OF TOTAL)	TRAINING DEVELOPMENT (% OF TOTAL)	TESTING AND EVALUATION (% OF TOTAL)	PROJECT MANAGEMENT ^a (% OF TOTAL)	EVALUATION INTERFACE (% OF TOTAL)
Labor and Overhead	\$849,278	76.1%	9.1%	2.7%	12.0%	0.1%
Other Direct Costs:						
Travel	24,121	99.9	0	0	0.1	0
Consultants ^b	3,867	*	*	*	*	*
Reproduction	18,280	90.7	9.3	0	0	0
Other Miscellaneous Direct Costs ^c	92,229	85.3	14.3	0	0.3	0
General and Administrative ^d	<u>87,238</u>	<u>*</u>	<u>*</u>	<u>*</u>	<u>*</u>	<u>*</u>
Total Cost/Percent of Cost	1,076,013	77.9	9.3	2.3	10.3	0.1

^aProject Management activity includes some system engineering (26% of time for activity).

^bConsultants included in Other Miscellaneous Direct Costs in PRC breakdown. Percentage distribution shown for Other Miscellaneous Direct Costs reflects consultant cost.

^cOther Miscellaneous Direct Cost total includes \$1,370 for communication.

^dNo breakdown of General and Administrative costs available by activity.

Source: PRC Cost Summaries.

Exhibit III-B3

Percentage Distribution of PRC Labor Hours by Category

	PHASE I JULY 1983- JAN. 1984	PHASE II JAN. 1984- AUG. 1984	PHASE III SEPT. 1984- JAN. 1985 FEB. 1985- JUNE 1985	
Category I: Senior Scientists, Project Director	15%	6%	4%	3%
Category II: Senior Programmer Analyst, Systems Application Specialist	32%	29%	32%	27%
Category III: Programmer Analyst	30%	44%	14%	2%
Category IV: Associate Programmer Analyst, Associate Systems Analyst	20%	12%	10%	4%
Category V: Assistant Programmer Analyst	4%	6%	14%	15%
Category VI: Programmer, Data Librarian, Clerical	<u>0%</u>	<u>3%</u>	<u>27%</u>	<u>49%</u>
TOTAL HOURS: (Includes operations in Phase III)	5,929	24,121	15,689	12,046

Source: PRC Cost Summaries and Invoices submitted to FNS.

effort at the lower skill levels (technicians and operators). The proportion of labor in the lowest category (Category VI) increased from 27 percent in the early part of implementation to 49 percent in the latter part of implementation. This change reflects the shift in emphasis from implementation to operation and trouble-shooting.

As Exhibit III-B4 shows, the PRC labor effort and cost for implementation was defined as the difference between total labor and operations labor for the August 1984 - June 1985 period. It was assumed that the system was fully implemented and in steady state as of July 1985. Total labor hours, average wages, PRC staff, and PRC overhead rates were obtained from FNS documents. Operations labor hours and costs were estimated by averaging invoiced PRC hours and wages for August through October 1985 and adding overhead costs. Operations costs were not applicable to August and September 1984 because the EBT system was not yet operational.

The \$57,545 in non-labor PRC costs for system implementation were estimated as follows:

- Telephone line installation - total, \$22,275: based on a total of 100 telephone lines installed as of December 1985, less 3 per month (FNS estimate) for 15 months of operations, leaving 55 lines installed prior to start-up of operations. Assumed cost: \$405 per line, from FNS estimate for PDPW takeover costs.
- Travel - total, \$34,255: Steady-state travel cost (\$1,283 per month) estimated from September - November 1985 invoices. Implementation-related travel assumed to be the difference between total reported Phase III travel and subsistence (\$53,500) and 15 months' travel at steady-state rate (\$19,245).
- Equipment installation, \$1,015: As reported in PRC invoice for installation of Series/1 computer by lessor.

These figures represent the best possible estimates from the available data. PRC's cost reports did not permit a clear delineation of non-labor implementation costs. The final cost to FNS for system implementation is under negotiation at this time.

Exhibit III-B4

**PRC Labor and Overhead for EBT System Implementation
August 1984 to June 1985**

<u>Month</u>	<u>Total Labor Hours</u>	<u>Total Person Years</u>	<u>Total Labor & Overhead</u>	<u>Operations Person Years</u>	<u>Operations Labor & Overhead</u>	<u>Implementation Person Years</u>	<u>Implementation Labor & Overhead</u>
August 1984	1,872	0.90	\$ 5,110	0.00	\$ -0-	0.90	\$ 58,110
September 1984	2,339	1.12	72,606	0.00	-0-	1.12	72,606
October 1984	3,818	1.84	118,501	0.83	31,094	1.01	87,407
November 1984	2,627	1.26	81,546	0.83	31,094	0.44	50,452
December 1984	3,003	1.44	93,218	0.83	31,094	0.62	62,124
January 1985	2,030	0.98	63,014	0.83	31,094	0.15	31,920
February 1985	2,409	1.16	65,239	0.83	31,094	0.33	34,145
March 1985	2,409	1.16	65,239	0.83	31,094	0.33	34,145
April 1985	2,409	1.16	65,239	0.83	31,094	0.33	34,145
May 1985	2,409	1.16	65,239	0.83	31,094	0.33	34,145
June 1985	<u>2,409</u>	<u>1.16</u>	<u>65,239</u>	<u>0.83</u>	<u>31,094</u>	<u>0.33</u>	<u>34,145</u>
Total	27,735	13.33	\$813,189	7.43	\$279,846	5.91	\$533,343

Source: PRC invoices.

Notes:

1. Total hours for August 1984-January 1985 as reported on invoices and tabulated by FNS. Total hours for February-June 1985 based on FNS estimated average of 1.16 person-years per month for period. Hours for operations as estimated from August-October 1985 PRC invoices.
2. Total labor and overhead per hour for August 1984-January 1985 estimated from average cost per hour by labor category and average distribution of hours by category for period. Same procedure used for February-June 1985 estimate of total labor and overhead. Operations labor and overhead as estimated from August-October 1985 PRC invoices.

APPENDIX III-C

INDIRECT COST FACTORS FOR OPERATING COST ANALYSIS

Indirect cost factors were computed for three levels of operations with ATP and EBT systems: Berks County Assistance Office, other PDPW units, and FNS national level units. The other levels (MARO and PFO) provided sufficient data on supervision and non-personnel costs to make the estimation of indirect cost factors unnecessary. The procedures used for the BCAO, PDPW and FNS national indirect cost factors are described below.

BCAO INDIRECT COSTS

BCAO indirect costs consist of unit supervision, county office administration, and non-personnel support costs (telephone, supplies, office equipment, rent, etc.). The BCAO staff roster for the fall of 1985 was used to identify the unit supervision and county office administration personnel. The BCAO executive director identified the job classifications for the supervision and administrative personnel. PDPW average salaries and benefits for these job classifications were used to estimate the cost per month. Reported BCAO non-personnel costs for the 1984-1985 state fiscal year were used for the non-personnel cost factor.

Exhibit III-C1 shows the calculations for the BCAO indirect cost factors. Casework supervision and organization includes immediate supervisors and two unit managers. The costs are applied to all direct-service caseworkers and human service aides, including intake, eligibility, and special functions units. Clerical supervision represents the two supervisors in the clerical unit. County office administration includes the executive director, the county supervisor, administrative officer, and two clerical support staff assigned to administration. The CAO administration costs are applied to all direct-service clerical and casework staff, as were the non-personnel costs.

The BCAO indirect cost factors were applied individually to the direct labor time spent on issuance functions. For example, clerical time for paper ID issuance was 5 percent of a full time equivalent (FTE). This percentage was applied to the \$81 per FTE for clerical cost, the \$132 per FTE

Exhibit III-C1

BCAO Indirect Cost Factor Calculations

<u>Indirect Cost Category</u>	<u>Total Cost per Month</u>	<u>Number of Applicable Staff</u>	<u>Cost per staff</u>
Caseworker supervision and management	\$36,779	71	\$518
Clerical supervision	\$2,255	28	\$81
CAO administration	\$13,049	99	\$132
Non-personnel cost	\$22,248	99	\$225

Source: BCAO staff roster, PDPW wage scale, BCAO cost report (BFM-27) for 1984-1985 state fiscal year.

for CAO administration, and the \$225 per FTE for non-personnel cost. Thus, the BCAO indirect cost for this clerical time was \$22 per month.

PDPW INDIRECT COST FACTORS

These cost factors were computed to allocate PDPW statewide overhead costs for the food stamp program. Overhead costs were identified from PDPW worksheets for computing the "other" cost category for the FNS-269 cost report. They were:

- Departmental headquarters cost: \$127,382 (applicable to all other food stamp program costs)
- Income maintenance headquarters, policy and program management: \$212,217 per month (applicable to all food stamp program costs except departmental headquarters and income maintenance headquarters/policy/program management);
- County assistance office administration (state-level): \$137,571 per month (applicable to all county assistance office food stamp costs, including certification and CAO costs reported under "other" on FNS-269).

The indirect cost factors were computed by taking the ratio of each indirect cost total to the sum of all direct costs to which it should be applied. Direct issuance costs that were included in an indirect cost category total were excluded from the indirect cost and the base before computing the ratio. The indirect costs and bases are shown below.

PDPW Indirect Costs and Applicable Direct Cost Bases

<u>Indirect Cost Element</u>	<u>Cost per month</u>	<u>Base of applicable monthly costs</u>	<u>Ratio of indirect cost to base</u>
Departmental headquarters	\$127,382	\$5,582,508	2.28%
Income maintenance headquarters policy and program management	212,217	5,369,496	3.95%
County Assistance office management	137,571	3,850,530	3.57%

The factors were used by multiplying them by the appropriate costs. The departmental headquarters and income maintenance headquarters

factors (totalling 6.23 percent) were used to compute indirect costs for all state-level activity, except Division of Management Consulting Services, mailroom, and Bureau of Special Programs labor, all of which were assumed to be included in indirect cost categories. The departmental cost factor was used for the Bureau of Special Programs indirect cost. All three factors (totalling 9.8 percent) were loaded onto BSAO direct and indirect costs (as described above).

FNS INDIRECT COST FACTORS

The indirect cost factors for FNS were computed to allocate management costs for the FNS administrator, deputy administrators, and division chiefs. The average non-personnel cost per full-time equivalent (\$3,295 per year for FY 1986) was also applied to all national-level FNS staff costs, except for units that reported direct non-personnel costs in the interviews.

The factor for FNS administrator costs was 0.75 percent. This factor is the ratio of FNS administrator costs to all other FNS national and regional labor costs. It was calculated by the FNS Budget Office from FY 1986 estimates.

Factors were computed for the offices of the FNS deputy administrators for family nutritional programs, financial management, and administration. Each factor was the ratio of the cost of the deputy administrator's office to the total labor cost for staff under his jurisdiction. The computation of these factors is shown below.

FNS Deputy Administrator Cost Factors--Computation

<u>Deputy Administrator</u>	<u>Deputy Administrator Cost</u>	<u>Applicable Direct Labor Costs</u>	<u>Indirect Cost Factor</u>
Family Nutrition Programs	\$661,367	\$5,519,633	11.98%
Financial Management	165,455	3,082,866	5.37%
Administration	223,313	5,842,908	3.82%

All Costs were as planned for FY 1986.

Division-level FNS indirect cost factors were computed from planned FY1986 total labor costs, division management staffing information, and mid-

points for each position in the GS salary scale. The division cost factors are shown below.

FNS Division Chief Cost Factors--Computation

<u>Division</u>	<u>Cost of Division Chief's Office</u>	<u>Division total labor (less Chief)</u>	<u>Indirect Cost Factor</u>
Program Development	\$138,628	\$1,774,372	7.81%
Information Resource Management	131,692	2,555,793	5.15%
Accounting	110,403	1,315,689	8.39%
Program Accountability	138,628	3,471,372	3.99%
Program Information	80,598	751,289	10.73%

These factors were applied cumulatively to direct costs. That is, the formula for calculating the total labor and indirect cost for a given unit is:

$$\text{Total cost} = (\text{Direct labor cost}) \times (1 + F_A) \times (1 + F_B) \times (1 + F_C)$$

Where: F_A = Administrator cost factor
 F_B = Deputy Administrator cost factor
 F_C = Division cost factor

This cumulative method was necessary since the base to which the higher level indirect costs were allocated included the lower-level indirect costs.

APPENDIX III-D

EBT CENTER TIME STUDY RESULTS AND ALLOCATION OF PRC COSTS BY FUNCTION

EBT Center staff completed time logs of all activities during the months of May and October 1985. Every half hour, they recorded the time they spent on any of nearly 100 categories of activity. The categories included the activities that served the five issuance functions, as well as system maintenance, general office functions, and time not working.

Exhibit III-D1 shows the distribution of EBT staff time by activity from the October 1985 time study. This period was relatively stable in EBT operations, coming after the final system modifications in July and before the preparations for the PDPW takeover at the end of December. Thus, this time study is considered more representative of normal operations and more appropriate for comparison with the ATP system than the May time study.

As Exhibit III-D1 shows, the EBT staff reported a total of 1,697 hours in October 1985. This total included 955 hours that were directly assignable to issuance functions, 503 additional hours of work on system maintenance and other general tasks, and 239 hours of time not working. The percentage distribution of all work time is also shown in Exhibit IIID-1. Also shown in Exhibit III-D1, benefit delivery was the most time-consuming function, taking up 79 percent of all time spent directly on issuance functions. The largest component of this function was "normal system monitoring", which included time spent checking system displays, other observation of system operations, and probably some idle time. The other major function was reconciliation and monitoring, consuming 15 percent of total assigned time.

The shares of EBT staff time spent on each issuance function were used to allocate the estimated PRC operating costs to the functions. The monthly PRC operating costs are presented by line item in Exhibit III-D2. All of the line item totals (except store equipment leases) were multiplied by the percentage shares of EBT staff time to compute line item costs by function for comparison to the ATP system. Store equipment leases were the only cost associated with a single function (benefit delivery); all other PRC costs were applicable to all functions and thus had to be allocated.

Exhibit III-D1

Revised Late Demonstration Time Allocation Estimates

<u>Function</u>	<u>Reported Time (Hours)</u>	<u>Percent of Work Time</u>	<u>Percent of Assigned Time</u>	<u>Full time Equivalent</u>
Benefit authorization				
Issuance updates/problems	18.3	1.26%	1.92%	0.11
Support of BCAO functions	<u>14.8</u>	<u>1.02%</u>	<u>1.55%</u>	<u>0.09</u>
Total benefit authorization	33.1	2.27%	3.47%	0.19
Benefit delivery				
Normal system monitoring	453.4	31.10%	47.49%	2.62
Manual sales/grocer complaints	4.1	0.28%	0.43%	0.02
Delivery supplies	20.3	1.39%	2.12%	0.12
In-store equipment service	19.6	1.35%	2.06%	0.11
Install store equipment	8.5	0.58%	0.89%	0.05
Travel to/from store	48.3	3.31%	5.06%	0.28
In-office repair	90.5	6.20%	9.48%	0.52
Preventive maintenance	87.7	6.01%	9.19%	0.51
Other field activity	<u>21.7</u>	<u>1.48%</u>	<u>2.27%</u>	<u>0.12</u>
Total benefit delivery	754.0	51.71%	78.97%	4.35
Crediting retailers				
Bundle-up	11.5	0.79%	1.20%	0.07
Balance inquiries	<u>0.1</u>	<u>0.01%</u>	<u>0.01%</u>	<u>0.00</u>
Total crediting retailers	11.6	0.79%	1.21%	0.07
Managing retailers				
Minneapolis report	15.5	1.06%	1.63%	0.09
Reconciliation/monitoring				
Daily reconciliation	14.0	0.96%	1.47%	0.08
Extract file	36.0	2.47%	3.77%	0.21
Check reconciliation reports	47.6	3.26%	4.98%	0.27
Check extract reports	<u>42.9</u>	<u>2.94%</u>	<u>4.50%</u>	<u>0.25</u>
Total reconciliation/monitoring	140.5	9.64%	14.72%	0.81
Total assignable	954.7	65.48%	100.00%	5.51

Exhibit III-D1

Revised Late Demonstration Time Allocation Estimates
(continued)

<u>Function</u>	<u>Reported Time (Hours)</u>	<u>Percent of Work Time</u>	<u>Percent of Assigned Time^a</u>	<u>Full time Equivalent</u>
Unassignable/system activities				
Handle phone calls (other than above)	25.5	1.75%		0.15
System operations:				
Bucket shift	13.7	0.94%		0.08
Back-up/restore	30.4	2.09%		0.18
Shift turnover	64.1	4.40%		0.37
Pointer check	7.1	0.48%		0.04
L-copy	16.2	1.11%		0.09
Other operations	42.7	2.93%		0.25
Software problems	32.8	2.25%		0.19
Other problems/crash recovery	2.4	0.16%		0.01
General/support:				
Office management/meetings	35.9	2.46%		0.21
Special information requests	85.7	5.88%		0.49
Planning/reporting requirements	114.2	7.83%		0.66

Exhibit III-D2

Total Monthly PRC Costs and Cost Per Case Month

<u>Cost Element</u>	<u>Total Monthly Cost</u>	<u>Cost Per Case Month</u>
EBT Center labor & overhead	\$21,765.51	\$ 6.438
PRC Headquarters labor & overhead	9,328.74	2.759
Store equipment lease	23,019.00	6.808
Other equipment lease	14,460.00	4.277
Maintenance	1,765.00	0.522
Supplies	590.00	0.175
Communications	4,302.00	1.272
Travel	1,283.00	0.379
Reproduction	161.00	0.048
Subcontracts	21.00	0.006
Other costs	1,541.00	0.456
Nonlabor overhead, general and administrative	<u>7,325.11</u>	<u>2.167</u>
Total cost	\$85,561.36	\$25.307

Source: PRC cost reports and invoices. Caseload data from PDPW participation files.

Note: EBT Center and PRC Headquarters labor are August-October 1985 averages.

APPENDIX III-E

OPERATING COSTS OF ATP/COUPON AND EBT SYSTEMS

This appendix presents a detailed breakdown of the operating costs of the two issuance systems. These costs cover authorizing and delivering benefits, crediting retailers, managing retailer participation, and the monitoring and reconciliation of benefit transfers. The comparisons in Exhibits 3-2 through 3-6 of Section 3.2 are summaries of the information in Exhibits III-E1 through III-E10 (Exhibit 3-2 contains data from Exhibits III-E1 and III-E2, Exhibit 3-3 contains data from Exhibits III-E3 and III-E4, and so on).

Data on EBT card replacements by month are presented in Exhibit III-E11. This exhibit shows the number of EBT cards replaced during each month from October 1984 to December 1985. The cumulative number replaced is also shown. This exhibit illustrates the increasing rate of failure of EBT cards, which added to the BCAO effort to maintain EBT operations during the late demonstration period.

Exhibit III-E1

Cost of Authorizing Access to Benefits: ATP System

ITEM	TOTAL COST PER MONTH	APPLICABLE CASELOAD	COST PER CASE MONTH
<u>ID card issuance: labor costs:</u>			
• BCAO clerical labor - preparation, record keeping (Late Demonstration)	\$86.23	1,895	\$0.046
• BCAO caseworker labor - authorize, handle problems (Late Demonstration adjusted for missing/problem data)	40.94	1,895	0.022
• PDPW central office labor - document control and ordering for blank IDs (Late Demonstration)	13.86	396,426	0.000
• Indirect cost ^a			0.023
• Other ID card costs: blank card (5¢ each x 125 new cases/mo)	6.25	1,900	<u>0.003</u>
Total paper ID cost per case month			\$0.094
<u>ATP issuance - labor costs:</u>			
• BCAO clerical (all other ATP issuance, plus share of unassignable costs - Pre-Demonstration, adjusted)	180.32	1,859	0.097
• BCAO caseworker (all other ATP issuance or coupon, plus share of missing/problem cases - Pre-Demonstration, demonstration area adjusted for trend) ^b	133.85	1,859	0.072
• OIS labor for ATP handling and production (Late Demonstration)	3,307.30	396,426	0.008
• ATP management labor (All demonstration time; Late Demonstration \$)	285.06	396,426	0.001
• Mailroom labor to stuff ATPs in envelopes and bundle	552.23	222,000	0.002
<u>Other ATP issuance costs:</u>			
• Processing charge for issuance file (PDPW est. - Early and Late Demonstration)	29,895	396,426	0.075
• IBM computer cost to print ATPs from file (as above)	58,608	396,426	0.148
• ATP postage @ 18¢ (as above)	43,111	222,000	0.194
• Blank ATPs @ 2¢ (as above)	8,279	396,426	0.021
• Other mailing costs (presorting contract, stuffing equipment, envelopes)	5,140	222,000	0.023
• Indirect cost ^a			<u>0.089</u>
Total ATP issuance cost per case month			\$0.730
Total cost of authorizing access per case month			\$0.824

^aSee Appendix III-C for computation of indirect cost rate.

^bAdjustments to BCAO clerical and caseworker labor per ATP issuance are described in Appendix III-A.

Sources: BCAO Timestudy, PDPW interviews.

Note: All labor includes 42% fringe.

Exhibit III-E2

Cost of Authorizing Access to Benefits: EBT System

ITEM	TOTAL MONTHLY COST (BEST ESTIMATE)	APPLICABLE CASELOAD	COST PER CASE MONTH
<u>ID card, issuance and account activation:</u>			
• BCAO clerical labor - preparation, record-keeping, etc. ^a	\$679.95	3,381	\$0.201
• BCAO caseworker labor - new cards, problems ^a	182.46	3,381	0.054
• BCAO client training-special unit ^b	351.20	3,355	0.105
• ID cameras and card laminators ^c	173.80	3,381	0.051
• Encoder and PC ^d	615.08	3,381	0.182
• Blank cards (50 cents apiece) ^b	118.50	3,381	0.035
• Indirect cost ^e			<u>0.140</u>
Total photo ID cost per case month			\$0.768
<u>Posting benefits and client account problems:</u>			
• BCAO clerical labor - EBT PC functions, other EBT account problems, share of unassignable costs ^b	\$376.71	3,381	0.111
• BCAO caseworker - EBT account problems, convert EBT to ATP, treatment problems, other, share of unassignable costs ^b	116.04	3,381	0.034
• OIS - special labor for issuance file creation and transmission and maintaining program	366.00	3,381	0.108
• OIS - processing cost for issuance files	263.00	3,381	0.078
• PDPW Indirect Cost ^e			0.056
• EBT Center labor and overhead for processing issuances (plus allocated share of time not assigned directly to functions) ^f	755.06	3,381	0.223
• PRC HQ labor and overhead (allocated share) ^f	323.62	3,381	0.096
• Other PRC direct costs (allocated share) ^{d, f}	221.75	3,381	0.066
• PRC indirect costs (allocated share) ^f	174.80	3,381	<u>0.052</u>
Total benefit posting and account problem cost per case month			0.824
Total: All benefit access authorization			1.592

^a Late Demonstration.

^b Wave 2 only for client training; Early and Late Demonstration average for blank IDs and clerical and caseworker benefit-related costs.

^c ID camera and laminator cost represents monthly payment to amortize purchase price over five years at 5 percent interest adjusted for share attributable to other photo IDs.

^d Encoder and PC cost is estimated lease cost. The total PRC other direct costs allocated to this function were reduced to avoid double counting.

^e See Appendix III-C for computation of indirect cost rate. Applied only to cost per case month.

^f Allocation of EBT Center labor and all other PRC costs based on proportion of assignable EBT Center labor (3.47%) associated with benefit issuance. Proportion determined by October 1985 EBT Center time study (see Appendix III-D for allocation data).

Sources: BCAO time study, PDPW interviews, PDPW data, PRC data, EBT Center time study.

Note: All PDPW labor includes 42 percent fringe.

Exhibit III-E3

Cost of Delivering Benefits to Recipients: ATP System

COST ELEMENT	TOTAL COST PER MONTH	APPLICABLE CASELOAD	COST PER CASE MONTH
<u>Coupon production, shipping and management:</u>			
• Production contract (FNS) ^a	\$1,666,667	7,334,528	\$0.227
• Central storage and distribution contract (FNS) ^a	58,333	7,334,528	0.008
• Shipping to state storage/issuance points (FNS) ^a	166,667	7,334,528	0.023
• FNS national office ordering system and related labor (CPSU) ^a	16,470	7,334,528	0.002
• MARO ordering system and related labor (CIAU) ^b	*	*	*
• PDPW ordering system and related labor (DFSAS) ^c	4,509	396,426	0.011
• PDPW storage and delivery contract ^c	22,693	396,426	0.057
• Indirect cost (PDPW and FNS) ^d			<u>0.004</u>
Total coupon production, shipping and management cost per case-month			\$0.332
<u>Transaction of ATP card for coupons:</u>			
• Issuance office fees (\$1.10 per ATP) ^c	263,454	222,000	1.187
• Issuance office payment (PDPW comptroller) ^c	462	396,426	0.001
• Issuance office management (DFSAS) ^c	1,958	396,426	0.005
• DFSAS non-personnel costs for issuance office management ^c	598	396,426	0.002
• PDPW indirect cost ^d			<u>0.074</u>
Total ATP transaction cost per case month			\$1.269
Total benefit delivery cost per case month			\$1.601

^aFNS costs are for FY85.

^bMARO costs: not separable from reconciliation and monitoring (see Exhibit III-E9).

^cPDPW: Late Demonstration estimate. Non-labor costs included in OIS reconciliation processing (see Exhibit III-E9). Issuance office fees apply only to non-direct delivery caseload; separate fee structure for direct delivery.

^dSee Appendix III-C for computation of indirect cost rates.

Sources: PDPW, FNS interviews.

Exhibit III-E4

Cost of Delivering Benefits to Recipients: EBT System

COST ELEMENT	TOTAL COST PER MONTH	APPLICABLE CASELOAD	COST PER CASE MONTH
EBT center labor and overhead ^a - includes monitoring normal operations, store equipment instal- lation and service, delivery of supplies, plus allocated share of time not assignable directly to functions	\$17,189.08	3,381	\$5.084
PRC HQ labor and overhead (allo- cated share) ^a	7,367.27	3,381	2.179
Store equipment leases	23,019.00	3,381	6.808
Other equipment leases (allocated share) ^a	11,419.63	3,381	3.378
PRC communications (allocated share) ^{a,b}	3,397.46	3,381	1.005
Other PRC direct costs (allocated share) ^a	4,233.79	3,381	1.252
PRC indirect costs ^c	6,265.63	3,381	1.853
Grocer telephone charge reimbursement (FNS) ^d	224.15	3,381	<u>0.066</u>
Total Benefit Delivery Cost per Case Month			\$21.625

^aAllocation of EBT Center labor and other PRC costs based on proportion of assignable EBT Center labor (78.97%) associated with benefit delivery. Proportion determined by October 1985 EBT Center time study. (See Appendix III-D for allocation data.)

^bPRC communications total (before allocation) includes line usage charges and installations during steady-state operations.

^cPRC indirect cost includes overhead for non-labor costs allocated to this function and general and administrative cost for all costs allocated for this function.

^dGrocer telephone reimbursement estimated using number of transactions per month for stores reporting message unit charges in grocer survey.

Sources: PRC vouchers and cost reports, EBT Center time study, Fall 1985 grocer survey. Caseload is Late Demonstration EBT recipients.

Exhibit III-E5

**Cost of Crediting Retailers for Purchases
with Food Stamp Benefits: ATP System**

COST ELEMENT	TOTAL MONTHLY COST	APPLICABLE CASELOAD	COST PER CASE MONTH
Counting coupons, making change, endorsing, completing Redemption Certificates (retailer)	(No cost to government)		
Verifying coupon deposits, voiding coupons, completion of Food Coupon Deposit Documents and forwarding deposits to Federal Reserve (banks)	(No cost to government)		
Federal Reserve Bank Processing - fee to USDA (includes: verification of deposit documents, coupon count, check for counterfeits, destruction of coupons, credit to depositing bank, forwarding Redemption Certificates, Food Coupon Deposit Documents, and debit vouchers to USDA)	\$1,000,000	7,334,528	\$0.1363
FNS labor to monitor debit vouchers and reimburse Federal Reserve (Accounting Division)	3,000	7,334,528	0.0004
FNS indirect cost ^a	741	7,334,528	<u>0.0001</u>
Total Retailer Crediting Cost per Case Month			\$0.137

^aSee Appendix III-C for calculation of FNS indirect cost rate.

Sources: FNS interviews.

Note: All data are for FY 1985.

Exhibit III-E6

Cost of Crediting Retailers for Purchases with
Food Stamp Benefits: EBT System

COST ELEMENT	TOTAL MONTHLY COST	APPLICABLE CASELOAD	COST PER CASE MONTH
EBT Center labor and overhead for bundle-up processing, plus share of problem resolution and other unassignable labor ^a	\$264.00	3,381	\$0.078
PRC HQ labor and overhead (allocated share) ^a	113.15	3,381	0.033
Equipment lease (allocated share) ^a	175.39	3,381	0.052
PRC communications (allocated share) ^{a, b}	52.18	3,381	0.015
Other PRC direct costs (allocated share) ^a	65.02	3,381	0.019
PRC indirect costs (allocated share) ^c	61.12	3,381	<u>0.018</u>
Total EBT center and associated			\$0.216
Fees to American Bank and Trust (for initiating ACH transactions) ^d	758	3,381	0.224
Total Retailer Crediting Cost per Case Month			\$0.440

^aAllocation of labor and other PRC costs based on proportion of assignable EBT Center labor (1.21%) associated with crediting retailers. Proportion determined by October 1985 EBT Center time study.

^bPRC communications total (before allocation) includes line usage charges and installations during steady-state operations.

^cPRC indirect costs includes overhead for non-labor costs allocated to this function and general and administrative cost for all costs allocated for this function.

^dAs reported by PDPW for March 1986.

Sources: PRC vouchers and cost reports, PDPW cost reports, and EBT Center time study, except as noted below. Caseload is Late Demonstration EBT recipients.

Cost of Managing Retailer Participation - ATP System

COST ELEMENT	TOTAL MONTHLY COST	APPLICABLE CASELOAD	COST PER CASE MONTH
Field office labor for store authorization and training	\$4,353	227,857	\$0.019
Field office labor for monitoring store redemptions	871	227,857	0.004
Field office labor for initiating compliance	3,482	227,857	0.015
Field office non-personnel costs - all retailer/wholesaler functions	506	227,857	0.002
Field office travel - Berks County	77	5,532	<u>0.014</u>
Field Office Total			\$0.052
Regional office - Coupon Use and Redemption Unit labor (coordination of authorization, monitoring and compliance activities, other coupon use and redemption problems)	15,640	976,572	0.016
Non-personnel cost for MARO Coupon Use and Redemption Unit	760	976,572	0.001
CURU Total			<u>\$0.017</u>
Compliance Branch labor (field and central staff to conduct and support investigations)	179,167	7,334,528	0.024
Compliance Branch, other costs of investigations (temporary aides, coupons, services, travel, etc.)	70,417	7,334,528	0.010
Compliance Branch indirect costs ^a	30,996	7,334,528	0.004
Compliance Branch Total			<u>\$0.038</u>
Administrative Review Officers - labor to review sanctions imposed for redemption violations (includes support staff - central and regional offices)	85,333	7,334,528	0.0116
Administrative Review Division - non-personnel costs	3,592	7,334,528	0.0005
Administration Review Division indirect costs ^a	649	7,334,528	0.0001
Administration Review Division Total			<u>\$0.012</u>
Minneapolis Field ADP Center - labor for monitoring system (data entry, paper handling, computer operations, etc.)	55,833	7,334,528	0.008
Monitoring and validating Redemption Certificate data base (ADMA)	1,497	7,334,528	0.0002
ADMA Indirect costs ^a	396	7,334,528	0.0001
Redemption certificates, postage, scanners to read Redemption Certificates and associated maintenance and space	47,333	7,334,528	0.006
Other Minneapolis Field ADP Center direct costs ^b	42,917	7,334,528	0.006
Minneapolis Field ADP Center indirect cost ^a	424	7,334,528	<u>0.0001</u>
Total Redemption Monitoring System Cost			\$0.020
FNS Retailer policy and redemption system oversight	30,135	7,334,528	0.004
Indirect cost of retailer policy and redemption oversight ^a	8,162	7,334,528	0.001
Grand Total - Cost of Managing Retailer Participation			<u>\$0.144</u>

^aSee Appendix III-C for explanation of indirect cost factors.

^bThe annual cost from which this item was computed includes the last 5 months' payments on a 5-year lease-to-purchase plan for the MFDC computer equipment. Thus, this estimate implicitly assumes depreciation over a 12-year term for this equipment.

Sources: PFO, MARO, FNS national interviews, data submitted by Minneapolis Field ADP Center.
All data are FY 1985.

Cost of Managing Retailer Participation: EBT System (Estimates of
Marginal Increases from Baseline Cost under ATP System)

COST ELEMENT	TOTAL COST	APPLICABLE CASELOAD	COST/ CASE MONTH
<u>Baseline costs per case-month</u>			
<u>Field office</u> - labor and other - authorization, monitoring and compliance	-	-	\$0.052
<u>Regional Office</u> - Coupon Use and Redemption Unit - administration for authorization, monitoring and compliance - labor and other	-	-	0.017
<u>Compliance Branch</u> - investigation of redemption violations and associated administration - labor and other	-	-	0.038
<u>Administrative Review Division</u> - review of sanctions decisions on redemption violations - labor and other	-	-	0.012
<u>Minneapolis Data Center</u> - computer processing of redemption data files, associated labor, and other direct and indirect (excludes costs associated with Redemption Certificates and deposit documents)	\$80,450	7,334,528	0.011
Monitoring of redemption data base (including indirect cost)	-	-	0.0003
Retailer policy and redemption system oversight (including indirect cost)	-	-	<u>0.005</u>
Total Baseline Cost per Case Month			\$0.135
<u>Increments</u>			
Field office - extra time in field visits	52	3,381	0.015
Minneapolis - extra labor to read EBT tapes	30	3,381	0.009
EBT center - labor and overhead for monitoring retailer participation (including Minneapolis tape plus allocation of unassignable labor) ^a	353.82	3,381	0.105
PRC HQ - labor and overhead (allocated share) ^a	151.65	3,381	0.045
EBT Equipment lease (allocated share) ^a	235.06	3,381	0.070
PRC communication (allocated share) ^{a,b}	69.93	3,381	0.021
Other PRC direct costs (allocated share) ^a	87.15	3,381	0.026
PRC indirect cost (allocated share) ^c	81.91	3,381	<u>0.024</u>
Total Increment Cost per Case Month			\$0.315
Total Cost per Case Month			
Retailer Participation Management			\$0.450

^a Allocation of EBT Center labor and other PRC costs based on proportion of assignable EBT Center labor (1.63%) associated with managing retailer participation. Proportion determined by October 1985 EBT Center time study (see Appendix III-D for allocation data).

^b PRC communications total (before allocation) includes line usage charges and installations during steady state operations.

^c PRC indirect cost includes overhead for non-labor costs allocated to this function and general and administrative cost for all costs allocated for this function

Sources: FNS interviews, PRC cost reports and vouchers.

Exhibit III-E9

Reconciliation and Monitoring Costs: ATP System

COST ELEMENT	TOTAL MONTHLY COST	APPLICABLE CASELOAD	COST PER CASE MONTH
<u>PDPW labor</u>			
• Data Analyst labor to prepare cancelled ATP cards for processing, submit runs, check and resolve errors in card reading or key entry (OIS Production Control)	\$10,212	396,426	\$0.0258
• Management Analyst/Fiscal Technician labor to check results of key entry and reconciliation runs, resolve problems and prepare FNS-46 and composite FNS-250 reports (DFSAS)	5,843	396,426	0.015
• System Analyst to monitor and maintain reconciliation software and files (OIS)	801	396,426	0.002
<u>Other PDPW costs</u>			
• Charge for reconciliation processing (includes computer operators, hardware, maintenance, environment costs)	34,825	396,426	0.0878
• Report generation (printing charge)	5,934	396,426	0.015
• Data entry of FNS-250s and damaged ATPs	2,185	396,426	0.006
• Microfilming and storage of cancelled ATPs	6,459	396,426	0.016
• Terminal for DFSAS (used for all coupon functions)	184	396,426	0.0005
• PDPW indirect cost ^a			<u>0.010</u>
PDPW total for reconciliation			0.178
<u>MARO costs</u>			
• <u>Coupon Issuance and Accountability Unit Labor</u> - includes: Processing coupon orders, monitoring FNS-46 and FNS-250 submission, preparation for entry, validation, processing billings for FNS-46 and FNS-250 losses, and reviews of state issuance systems	19,023	976,572	0.0195
• Other MARO labor for reconciliation reports (PASU) (Late Demonstration)	192	976,572	0.0002
• Data entry contract (FNS-46, 250, 259) (Late Demonstration)	7,687	976,572	0.008
• Non-personnel cost and travel - MARO (reconciliation and monitoring)	2,053	976,572	<u>0.002</u>
MARO total for reconciliation and monitoring			0.030
<u>National-Level FNS costs</u>			
• Analysts to maintain reconciliation data base at Washington Computer Center (FNS-250, FNS-259, FNS-46)	3,667	7,334,528	0.0005
• Data processing costs at Washington Computer Center for reconciliation data bases	11,917	7,334,528	0.002

• Other staff and data processing equipment for reconciliation data bases	1,167	7,334,528	0.0002
• Analysis and reporting from FNS-46 and FNS-259	748	7,334,528	0.0001
• Monitoring and validating of FNS-250 reports	769	7,334,528	0.0001
• Printing of forms for reconciliation	1,144	7,334,528	0.0002
• Monitoring state issuance performance and regional office oversight	1,275	7,334,528	0.0002
• Issuance regulations and policy, forms design	6,432	7,334,528	0.001
• FNS indirect cost ^a	2,949	7,334,528	<u>0.0004</u>
National-level FNS total for reconciliation and monitoring			0.005
Total Reconciliation and Monitoring Cost per Case Month			\$0.213

^aSee Appendix III-C for computation of indirect cost rates.

Sources: PDPW interviews, MARO interviews, national-level FNS interviews. All data are FY 1985.

Exhibit III-E10
Reconciliation and Monitoring Costs: EBT System

Cost Element	Total Monthly Cost	Applicable Caseload	Cost Per Case Month
EBT Center labor and overhead to: run daily and periodic reports and file extracts; check reports; generate PDPW reconciliation tape; (includes share of unassignable labor) ^a	\$3,203.55	3,381	\$0.948
PRC HQ labor and overhead (allocated share) ^a	1,373.05	3,381	0.406
EBT equipment lease costs (allocated share) ^a	2,128.29	3,381	0.629
PRC communications (allocated share) ^{a,b}	633.19	3,381	0.187
Other PRC direct costs (allocated share) ^a	789.06	3,381	0.233
PRC indirect costs (allocated share) ^c	<u>741.65</u>	3,381	<u>0.219</u>
Total PRC reconciliation and monitoring costs			\$2.623
PDPW Analyst-monitoring PRC tape runs	32	3,381	0.010
PDPW processing of PRC reconciliation tape (prorated share of statewide processing cost)	351	3,381	0.104
PDPW project coordinator (reports, etc.)	795	3,381	0.236
PDPW indirect cost ^d			<u>0.012</u>
PDPW reconciliation total			\$0.362
FNS letter of credit maintenance (labor, non-personnel and indirect)	432	3,381	\$0.128
Total Reconciliation and Monitoring Cost per Case Month			\$3.113

^aAllocation of EBT Center labor and other PRC costs based on proportion of assignable EBT Center labor (14.72%) associated with reconciliation and monitoring. Proportion determined by October 1985 EBT Center time study. (See Appendix III-D for allocation data.)

^bPRC communications total (before allocation) includes line usage charges and installations during steady state operations.

^cPRC indirect cost includes overhead for non-labor costs allocated to this function and general and administrative cost for all costs allocated to this function.

^dSee Appendix III-C for computation of PDPW indirect cost rate.

Sources: PRC process and cost reports, PDPW interviews and data, and FNS interview (October 1986).

Exhibit III-E11

Monthly Replacement of Damaged EBT Cards

Month	Number of Cards Replaced	Cumulative Number Replaced
<u>1984</u>		
October	1	1
November	7	8
December	12	20
<u>1985</u>		
January	18	38
February	17	55
March	18	73
April	36	109
May	39	148
June	61	209
July	61	270
August	49	319
September	53	372
October	46	418
November	56	474
December	39	513

Source: Monthly reports compiled by the Berks County Assistance Office.

APPENDIX III-F

EBT OPERATING COSTS IN HYPOTHETICAL SCENARIOS

This appendix explains in detail the EBT operating cost projections for the hypothetical scenarios in Section 3.3. These scenarios were developed to test the effects of changes in key cost factors on the overall cost per case month. They were not intended as definitive projections for any actual EBT system. The projections represent three distinct EBT system configurations:

- stand-alone state EBT system: dedicated computers and terminals; staff shared with other state operations.
- integrated state EBT system: dedicated terminals; staff and mainframe computers shared with other state operations.
- piggy-back EBT system: some or all terminals shared with commercial POS system; data processing staff and computers shared with other state operations or commercial POS system.

The text of this appendix explains the assumptions and data sources for these projections. Exhibits III-F1 through III-F4 provide line item details of the projections.

ACTUAL DEMONSTRATION COST VERSUS STAND-ALONE STATE EBT SYSTEM

Exhibit III-F1 presents line item costs for the hypothetical stand-alone state EBT system in comparison with the actual operating cost for the demonstration EBT system. As described in Section 3.3, the stand-alone state system estimates represent what the EBT operating cost would have been if the operating configuration established for the extended demonstration had been used in the original demonstration. This configuration would have reduced costs through more efficient staffing, use of less senior and less costly personnel, and elimination of the premium paid for short-term equipment leases. The stand-alone system differs from the actual extended demonstration system in that the equipment is purchased new at the outset, rather than being bought used.

Exhibit III-F1

EBT System Operating Cost
Original Demonstration vs. Stand-Alone State System

Cost Element	Original Demonstration Cost	Stand-Alone State System Cost
<u>Food Stamp Program Costs:</u>		
Benefit issuance and reconciliation labor	\$ 404	\$ 339
Issuance/reconciliation data processing	614	614

The purpose of the stand-alone state system scenario is to isolate some of the factors behind the high cost of the demonstration EBT system. The stand-alone system is not necessarily the most likely scenario for a state with advanced data processing capacity. Such a state would probably prefer to integrate EBT processing into existing facilities, rather than purchasing dedicated computers. PDPW is developing such an integrated system for the extended EBT system.

The original EBT system costs in Exhibit III-F1 are as presented in Section 3.2. These costs were reorganized into the three major cost areas shown for comparison with the stand-alone state system and with the other projections. PDPW's cost reports for the extended demonstration are the primary sources for the stand-alone state system projections. The purchase cost for the equipment when new was used in place of the actual (used) equipment purchase cost, so that the monthly payment estimates would be comparable to the original demonstration lease cost. Other costs have been added or adjusted because the PDPW reported costs did not appear to include all of the costs measured for the demonstration. These adjustments are based on demonstration data and do not necessarily represent actual costs for the extended EBT system operations, which will be measured by a subsequent evaluation.

The following sections explain the sources and estimation procedures for each item of the stand-alone state EBT system cost projection. All indirect costs were estimated using the factors discussed in Appendix III-C.

Food Stamp Program Costs for Stand-Alone State EBT System

- Benefit issuance and reconciliation labor: labor on the PDPW mainframe computer system that is not included in PDPW cost reports. Estimate of time is from original demonstration; wage and benefit rate is from extended demonstration.
- Issuance/reconciliation data processing: computer and other costs for processing issuance and reconciliation files on PDPW mainframe system. These costs are not reported by PDPW, so estimate for original demonstration was used.
- BCAO labor and indirect cost: client interface labor and associated indirect cost. Estimated from PDPW cost reports for May-June 1986, which do not include clerical cost for photo ID tasks (preparing inserts, sched-

uling appointments, taking photos, laminating cards). Additional clerical cost estimated from October 1985 time study. Indirect cost was estimated for all BCAO labor (including Food Stamp Program and data base costs) and allocated between categories in proportion to staff time.

- BCAO work station: original purchase cost of equipment estimated at \$8,140 (based on PRC invoice data). Monthly cost is monthly payment to amortize original cost over 5 years (typical depreciation period) at 5 percent interest.
- Photo ID equipment, blank ID cards: as estimated for original demonstration (not reported by PDPW for extended demonstration).
- FNS redemption monitoring, reconciliation and retailer management: as estimated for original demonstration. These estimates include indirect cost.
- PDPW management and policy: Bureau of Special Programs (BSP) cost as reported by PDPW for extended demonstration (June 1986 report).
- Non-BCAO PDPW indirect: includes indirect cost for benefit issuance/reconciliation labor and data processing at OIS indirect cost rate (6.23 percent) and indirect cost for BSP management and policy at BSP indirect cost rate (2.28 percent). See Appendix III-C for estimation of indirect cost rates.

Data Base Costs for Stand-Alone State EBT System

- Data base hardware: original purchase cost of EBT Center equipment (\$205,464) estimated from PRC vouchers. Monthly cost is payment to amortize cost over 5 years (typical depreciation period for computers) at 5 percent interest.
- Operator/supervisor labor: as reported by PDPW for extended demonstration.
- Hotline labor: as reported by PDPW for extended demonstration, including client interface labor at BCAO and HSH, plus half of management time (0.05 FTE) reported for BCAO hotline staff.
- Technical support: as reported by PDPW for extended demonstration, including OIS staff and average PRC consulting cost for May-June 1986.

- Maintenance: contract costs as reported by PDPW (May-June 1986 average).
- ACH fees and delivery: as reported by PDPW for extended demonstration (May-June 1986 average).
- Other costs: consumables and other costs as reported by PDPW for extended demonstration (May-June 1986 average).
- Management labor: as reported by PDPW for extended demonstration.
- Indirect cost: includes \$223 for BCAO hotline indirect cost; indirect cost for all other data base costs estimated at OIS rate (6.23 percent).

Terminal and Communications Costs for Stand-Alone State EBT System

- Terminals and printers: original purchase cost (\$334,304) estimated from PRC vouchers. Monthly cost is payment to amortize purchase cost at 5 percent interest over 3 years (typical depreciation period for such equipment).
- Installation and repair: contract cost as reported by PDPW for extended demonstration.
- Communications: telephone charges as reported by PDPW for extended demonstration (May-June 1986 average).
- Grocer message units: as estimated for original demonstration.
- Indirect cost: OIS indirect cost rate (6.23 percent) applied to all direct terminal/communication costs.

INTEGRATED STATE EBT SYSTEM - HIGH-COST SCENARIO

High- and low-cost projections have been prepared for a hypothetical integrated state EBT system. Both sets of projections assume that the state maintains its own network of terminals and telephone lines for the EBT system. The EBT system is assumed to be integrated with other state data processing operations, sharing staff and computer facilities for maximum efficiency.

Integrated state system costs were projected for three levels of scale:

- a small city with 5,300 food stamp households and 200 participating retailers (modeled on Berks County);
- a major city with 130,000 food stamp households and 3,659 participating retailers (modeled on Philadelphia, Pennsylvania); and
- a large state with 400,000 food stamp households and 8,220 participating retailers (modeled on Pennsylvania).

These levels of scale were chosen as a framework for illustrating the relative importance of fixed and variable costs in overall EBT operating costs. Key parameters for the projections (number of retailers by type, number of households, number of assistance offices) were based on FNS and PDPW data for Berks County, Philadelphia and Pennsylvania.

The high-cost scenario for the integrated state system makes conservative assumptions about savings from increased terminal usage and scale economies. This scenario assumes that the state must deploy a terminal (and printer) for every 14 food stamp households. For the small city, this ratio is determined by the distribution of stores by type (extrapolated from the demonstration store population) and the number of terminals per store by type (including spares) established during the demonstration. (The same assumptions are used for the small city in the low-cost scenario). The high cost scenario assumes that the ratio of households per terminal cannot be increased, perhaps because of peak-load problems or increased maintenance due to wear on equipment. The high-cost scenario assumes relatively rapid increases in data base costs with increased scale (more so than the low-cost scenario).

The specific assumptions and data sources for the high-cost integrated state system scenario are discussed below. The line-item projections for this scenario are shown in Exhibit III-F2.

Food Stamp Program Costs

- All projected Food Stamp Program costs increase in proportion to increases in caseload (relative to the extended demonstration estimates) except work stations, management and policy, and overhead.

Exhibit III-F2

Monthly Operating Costs for Non-Demonstration
EBT System: High-Cost Scenario for Integrated State System

Cost Element	Small City Cost	Major City Cost	Large State Cost
<u>Food Stamp Program Costs:</u>			
Benefit issuance/reconciliation labor	\$531	\$13,035	\$40,106
Benefit issuance/reconciliation data processing	962	23,608	72,641
County Association Office labor and indirect	5,523	135,460	416,800
County Association Office workstation	154	3,080	9,477
Photo ID equipment	1,774	35,480	109,169
Blank cards	229	5,614	17,273
Redemption monitoring	107	2,600	8,000
Store authorization, monitoring and compliance	737	16,250	50,000
Management and policy	2,300	4,069	12,520
Indirect	280	5,128	15,777
Food Stamp Program Total	\$12,597	\$244,323	\$751,764
Cost per case month	2.377	1.879	1.879
<u>Data Base Costs:</u>			
Hardware	1,748	42,858	131,870
Operator/supervisor labor	2,465	4,930	14,790
Hotline labor	2,602	5,204	11,577
Technical support	1,264	2,528	7,584
Bank fees	912	14,319	31,997
Management	459	2,295	6,885
Indirect	664	4,645	13,100
Data Base Total	\$10,114	\$76,779	\$217,803
Cost per case month	1.908	0.591	0.545
<u>Terminal and Communications Costs:</u>			
Terminals	7,092	175,202	539,065
Printers	6,905	170,801	525,526
Installation	162	3,714	11,428
Maintenance	7,779	192,406	591,991
Supplies	500	12,381	38,095
Phone lines	5,316	97,254	218,482
Indirect	1,729	40,605	119,902
Terminal/Communications Total	\$29,483	\$692,362	\$2,044,489
Cost per case month	5.1563	5.326	5.111
GRAND TOTAL COST	\$52,194	\$1,013,465	\$3,014,056
COST PER CASE MONTH	15.497	7.796	7.535

Sources: Original demonstration data, PDPW cost reports for extended demonstration, PDPW projections for extended demonstration.

- Work station: assumes one work station per assistance office.
- Management and policy: Small city estimate assumes that the EBT coordination effort for a non-demonstration system on this scale would be one-half of the effort for the extended demonstration. Major city cost assumed to be double small city cost. Statewide system cost assumed to be 3.1 times major city cost (i.e., in proportion to caseload increase).
- Overhead: indirect cost using applicable factors for Bureau of Special Programs labor and other direct costs.
- FNS reconciliation of letter of credit is not included because of lack of appropriate data on non-demonstration costs.

Data Base Costs

- Data base hardware cost is as estimated by PDPW/OIS: \$0.04 per transaction plus 18 SUP hours per 400,000 cases (at \$215 per SUP hour) for batch processing. This cost includes computers, routine operator effort, software, maintenance, utilities, and telephone access for the EBT Center. Batch processing time is assumed proportional to number of cases; cost per transaction is constant because computers are shared with other programs and equipment capacity is sufficient to support statewide system.
- Data base operator/supervisor labor: small city system labor is as esimated by PDPW. Major city system is 2 times labor for small city system; large state system operator/supervisor labor is 3 times labor for major city system. This is incremental labor for special EBT functions (reconciliation, etc.) and trouble-shooting. Thus, it can be assumed to be somewhat independent of scale but subject to quantum leaps with increases in system complexity.
- Hotline labor: small city cost is same as extended demonstration cost; this assumes savings due to non-demonstration environment. Major city system hotline cost is double Berks County cost, assuming some economies of scale due to specialization of staff, use of lower-level staff, etc. Large state system hotline cost is same per store as major city system cost.
- Technical support labor: small city cost is derived from extended demonstration cost, using same OIS labor plus two-thirds of PRC cost for May-June 1986 (reflecting lower state salaries). Cost for major city is 2

times small city cost; large state cost is 3 times major city cost. Rationale is same as for operator/supervisor labor.

- Bank fees: assumes \$137 per month courier cost (as reported in extended demonstration) and other fees proportional to number of stores, extrapolating from \$562 per month for 145 demonstration stores (as reported for extended demonstration).
- Management: small city cost is same as for extended demonstration (0.10 FTE). Major city effort is 0.5 FTE; large state requires 1.5 FTE. These assumptions imply almost no economies of scale--increases are nearly proportional to increase in caseload.
- Indirect cost: applies to all data base costs at 6.23 percent except CAO labor for hotline (extrapolated in proportion to direct cost).

Terminal and Communications Costs

- Terminal cost: assumes \$435 purchase cost per terminal, amortized at 5 percent interest over 3 years (typical depreciation period). Terminal requirements estimated by assuming 14 households per active terminal (as required under low-cost scenario for small city--see below). Additional terminal requirements (balance-only and spares) estimated by using ratios from original demonstration. Terminal and printer purchase costs estimated from PRC voucher data.
- Printer cost: assumes \$458 purchase cost per printer, amortized at 5 percent interest over 3 years (same schedule as terminals). Assumes one printer for each active terminal, plus same ratio of spares to active printers as in original demonstration.
- Installation: assumes installation rate of 1 percent of active terminals per month, at cost of \$40 per installation (as charged by extended demonstration vendor).
- Maintenance: cost is \$9 per active terminal and \$11 per active printer, as charged by extended demonstration vendor.
- Supplies: as estimated by PDPW for small city. Constant cost per terminal assumed in extrapolating to major city and large state.

- EBT phone lines: assumes constant cost per store, extrapolated from extended demonstration (May-June 1986 cost). Includes grocer message units.
- Indirect: OIS rate (6.23 percent) applied to all direct terminal costs.

INTEGRATED STATE EBT SYSTEM: LOW-COST SCENARIO

As indicated in the previous section, the low-cost scenario for the integrated state EBT system assumes the same configuration as the high-cost scenario: a dedicated terminal network, shared data processing facilities, and shared staff. The assumptions that differ from the high-cost scenario are explained below. The line item projections are shown in Exhibit III-F3.

Food Stamp Program Costs

All costs are the same as under the high-cost scenario.

Data Base Costs

- Operator/Supervisor labor: small city cost as estimated by PDPW. Assumed to be fixed--no increase for major city or large state. This is a strong assumption but, as Exhibit III-F3 shows, it makes little difference in the cost per case month.
- Technical support labor: small city cost same as high-cost scenario (see above). Assumed to be fixed--no increase for major city or large state. This assumption also has little effect on the cost per case month, as shown by Exhibit III-F3.
- Management labor: small city effort same as high-cost scenario (0.10 FTE). Major city level of effort is 0.25 FTE; large state effort is 0.5 FTE. This assumes economies of scale up to the large state level.

Terminal and Communications Costs

- Terminals: same monthly cost per terminal as high-cost scenario. Terminal requirements estimated from distribution of stores by major type and average number of terminals per store (including spares and balance-only terminals) by type from demonstration. Distribution of stores by type for small city extrapolated from demonstration area. Distribution of stores by type for major city and total provided by PFO; total and distribution for large state provided by MARO. This scenario

Exhibit III-F3

Monthly Operating Costs for Non-Demonstration
EBT System: Low-Cost Scenario for Integrated State System

Cost Element	Small City Cost	Major City Cost	Large State Cost
<u>Food Stamp Program Costs:</u>			
Benefit issuance/reconciliation labor	\$531	\$13,035	\$40,106
Benefit issuance/reconciliation data processing	962	23,608	72,641
County Association Office labor and indirect	5,523	135,460	416,800
County Association Office workstation	154	3,080	9,477
Photo ID equipment	1,774	35,480	109,169
Blank cards	229	5,614	17,273
Redemption monitoring	107	2,600	8,000
Store authorization, monitoring and compliance	737	16,250	50,000
Management and policy	2,300	4,069	12,520
Overhead	280	5,128	15,777
Food Stamp Program Total	\$12,597	\$244,323	\$751,764
Cost per case month	2.377	1.879	1.879
<u>Data Base Costs:</u>			
Hardware	1,748	42,858	131,870
Operator/supervisor labor	2,465	2,465	2,465
Hotline labor	2,602	5,204	11,577
Technical support	1,264	1,264	1,264
Bank fees	912	14,319	31,997
Management	459	1,148	2,295
Indirect	664	4,342	11,653
Data Base Total	\$10,114	\$71,599	\$193,120
Cost per case month	1.908	0.551	0.483
<u>Terminal and Communications Costs:</u>			
Terminals	7,092	83,530	320,275
Printers	6,905	81,701	312,543
Installation	162	1,912	7,333
Maintenance	7,779	91,891	351,909
Supplies	500	5,923	22,656
Phone lines	5,316	97,254	218,482
Indirect	1,729	22,566	76,828
Terminal/Communications Total	\$29,483	\$384,777	\$1,310,026
Cost per case month	5.563	2.960	3.275
GRAND TOTAL COST	\$52,194	\$700,699	\$2,254,911
COST PER CASE MONTH	9.848	5.390	5.637

Sources: Original demonstration data, PDPW cost reports for extended demonstration, PDPW projections for extended demonstration, FNS retailer participation data.

permits the ratio of households per terminal to rise above the limit of 14 set for the high-cost scenario.

- Printers: same monthly cost per printer as high-cost scenario. Printer requirements estimated using same methodology as for terminals.
- Installation, maintenance and supplies: these costs reduced (relative to high-cost scenario) in proportion to reduction in terminal requirements for major city and large state. Basic assumption is same as under high-cost scenario: constant cost per active terminal/printer.

PIGGY-BACK EBT SYSTEM SCENARIOS

Exhibit III-F4 shows the detailed costs for the scenarios for hypothetical piggy-back systems. As explained in Section 3.3, the full piggy-back scenario assumes that all data base and terminal/communications functions are performed by a commercial POS system. The specific assumptions of the full piggy-back scenario are:

- Food stamp program costs are reduced by the cost of CAO card issuance functions (including card creation, card problem resolution, and non-labor costs associated with cards). Management and policy costs and non-CAO indirect costs fall in proportion to the savings in state labor.
- Data base direct costs are covered by a fee of \$0.15 per household account per month, plus \$1.50 per account to start up. Data base and terminal fees were obtained in interview with Richard Urban, MAC Network, May 20, 1986. Assumes 5 percent new households per month. Account opening fee includes issuing benefit cards. OIS indirect cost rate applies to direct data base cost.
- Terminal costs are covered by fees of \$0.07 per transaction for switching and \$0.09 per transaction for terminal owner's costs. Demonstration transaction rate of 8 per household is assumed. OIS indirect cost rate applies to direct terminal cost.

The partial piggy-back scenario assumes that the state food stamp agency and FNS perform the same Food Stamp Program functions, at the same cost, as under the integrated EBT system. The state also performs most of the same data base functions. Data base costs for this scenario are estimated at the midpoint between high and low integrated system costs for operator labor

Exhibit III-F4

Monthly Operating Costs for Non-Demonstration
EBT System: "Piggy-Back" Scenarios

Cost Element	Full Piggy- Back Cost (Small City)	Partial Piggy- Back Cost (Small City)	Partial Piggy- Back Cost (Major City)	Partial Piggy- Back Cost (Large State)
<u>Food Stamp Program Costs:</u>				
Benefit issuance/reconciliation labor	\$531	\$531	\$13,035	\$40,106
Benefit issuance/reconciliation data processing	962	962	23,608	72,641
County Assistance Office labor and indirect	696	5,523	135,460	416,800
County Assistance Office workstation	NA	154	3,080	9,477
Photo ID equipment	NA	1,774	35,480	109,169
Blank cards	NA	229	5,614	17,273
Redemption monitoring	107	107	2,600	8,000
Store authorization, monitoring and compliance	737	737	16,250	50,000
Management and policy	466	2,300	4,069	12,520
Overhead	104	280	5,128	15,777
Food Stamp Program Total	\$3,604	\$12,597	\$244,323	\$751,764
Cost per case month	0.680	2.377	1.879	1.879
<u>Data Base Costs:</u>				
Hardware	\$1,193	\$1,748	\$42,858	\$131,870
Operator/supervisor labor (FEE)		2,465	3,698	8,628
Hotline labor (FEE)		2,199	4,944	9,411
Technical support (FEE)		1,264	1,896	4,424
Bank fees (FEE)		912	14,319	31,997
Management (FEE)		459	1,148	2,295
Indirect	74	626	4,434	12,021
Data Base Total	\$1,267	\$9,673	\$73,295	\$200,644
Cost per case month	0.239	1.825	0.564	0.502
<u>Terminal and Communications Costs:</u>				
Switch fee	\$2,968	\$1,307	\$10,340	\$119,028
Deployer fee	3,816	1,680	13,295	153,037
Terminals (FEE)		3,127	60,120	123,598
Printers (FEE)		3,115	59,353	124,706
Installation (FEE)		68	1,291	2,712
Maintenance (FEE)		3,502	66,863	140,482
Supplies (FEE)		225	4,303	9,040
Communications (FEE)		4,231	87,020	167,280
Indirect	423	1,075	18,851	52,325
Terminal/Communications Total	\$7,207	\$18,329	\$321,436	\$892,207
Cost per case month	1.360	3.458	2.473	2.231
GRAND TOTAL COST	\$12,077	\$40,598	\$639,055	\$1,844,616
COST PER CASE MONTH	2.279	7.660	4.916	4.612

Sources: Original demonstration data, PDPW cost reports and projections for extended demonstration, FNS retailer participant data, interview with Richard Urban (MAC).

and technical support. These costs are related to the computer operations, which are the same as under the integrated system. The hotline labor estimate is reduced by the proportion of stores that provide their own terminals (supermarkets). The low-cost integrated system estimate is used for management labor, reflecting the lower overall effort for data base functions. Other direct data base costs are the same as under the integrated system scenarios.

The terminal cost estimates for the partial piggy-back scenario are based on the assumption that the state agency deploys and maintains terminals in all stores except supermarkets. Thus, the deployer fee (\$0.09 per transaction) and the switch fee (\$0.07 per transaction) cover all costs for supermarket terminals. (See above for explanation of estimated terminal requirements by type.) The number of supermarket transactions was estimated in three steps: (1) the ratio of supermarkets to all stores (A) and the ratio of supermarket transactions to all transactions (B) were computed for the demonstration area; (2) the ratio of (B) to (A) was computed; (3) the estimated total transactions for each permanent system was multiplied by the ratio of supermarkets to all stores and the (B)/(A) ratio from the demonstration. (We assumed that the ratio of the supermarkets' share of transactions to their share of stores would be constant.) The terminal costs for stores other than supermarkets are based on the low-cost integrated system estimates, reduced by the ratio of supermarkets to all stores. The OIS indirect cost rate is applied to all direct terminal costs, including fees.

It is possible that the fees for a piggy-back system might vary with system size. For example, a POS operator would probably offer a lower price to a 400,000-case state than a 40,000 case state. We have not attempted to project this variation because we have no suitable data. It should be noted, however, that the rates we have used were quoted for serving the demonstration caseload of 3,400.

APPENDIX V

APPENDIX V-A

DATA SOURCES FOR ANALYSIS OF EBT EFFECTS OF RETAILERS

When the EBT system began operating, on October 1, 1984, 102 retailers were authorized and equipped to participate. By the end of the demonstration, in December 1985, 162 retailers had had EBT equipment installed in their stores. Exhibit V-A1 shows the distribution of these stores among categories normally applied in FNS monitoring systems.

The distribution of store type in the demonstration roughly parallels the distribution for the nation as a whole. Supermarkets, which account for about three-quarters of all food store redemptions nationwide, make up

Exhibit V-A1

Store Distribution by FNS Code

FNS Code Name	Number of Stores in Demonstration	Percentage of Stores in Demonstration	Percentage of Stores Nationwide
Small/Medium Grocery (GS)	45	27.8%	28.8%
Specialty Food (SF)	42	25.9	9.0
Supermarket (SM)	24	14.8	15.5
Convenience (CS)	15	9.3	21.6
Other Combination (CO)	14	8.6	1.4
Combination Grocery/Gas (CG)	9	5.6	10.2
Produce Stand (PS)	5	3.1	2.7
Other Firm (OF)	3	1.9	0.1
Health/Natural Food (HF)	2	1.2	1.2
Combination Grocery/Deli (CD)	1	0.6	0.4
Comb. Grocery/Merchandise (CM)	1	0.6	2.4
Milk Route (MR)	1	0.6	0.7
Other	<u>0</u>	<u>0.0</u>	<u>6.0</u>
	162	100.0	100.0

Source: PRC Retailer Inventory File. National figures come from Program Accountability Division, FNS, Food Stamp Program: State Tables of Activity Ranking, Plus. Alexandria, VA: Food and Nutrition Service, April 1986.

month, 125 retailers conducted EBT transactions. Also, 7 demonstration stores refused before the demonstration began to be interviewed for the evaluation. Therefore, no data are available for these retailers.

Retailers located in the central four ZIP Codes of Reading constitute approximately 60 percent of the evaluation sample. The remaining 40 percent of retailers are located outside the central area, but within a five-mile radius of downtown Reading.

INTERVIEWS WITH STORE OWNERS AND MANAGERS

Data for evaluating EBT effects on retailers were gathered in a series of four in-person interviews and two telephone interviews with store owners or managers. Where necessary, as in multi-unit operations, a headquarters interview also was conducted. The timing and content of these interviews are described below:

- The Initial Store Worksheet (June-July 1984) assessed retailer perceptions about the potential effects of EBT on store operations and gathered background information.
- The Pre-Demonstration interview (July-September 1984) gathered baseline data from which cost estimates were derived for the ATP/coupon system.
- The Start-up interview (November-December 1984) examined system start-up issues and initial EBT training costs; also, monitored changes in store operations (telephone interview).
- The Early Demonstration interview (January-April 1985) noted retailers' initial perceptions of the EBT system and gathered EBT cost data.
- The Interim interview (June-July 1985) examined the extent and nature of EBT-related problems and tracked changes in store operations (telephone interview).
- The Late Demonstration interview (October-December 1985) noted continuing perceptions of EBT, gathered cost data, and made summary system comparisons.

In addition, attempts were made to conduct interviews with stores that dropped out of the demonstration. Eleven of these interviews were completed, and 13 could not be completed because the stores had gone out of business and the owners were unavailable. Exhibit V-A2 shows the number of

Exhibit V-A2

Number of Interviews by Major Store Type

Instrument	Major Store Type				Total
	Supermarket	Grocery Store	Convenience Store	Other	
Initial Store Worksheet	20	73	21	26	140
Pre-Demonstration	18	65	18	22	123
Start-up	20	60	20	22	122
Early Demonstration	18	58	18	16	110
Interim	19	54	18	14	105
Late Demonstration	19	52	19	19	109

retailers interviewed in each data collection phase, by major store type. Excluding the 11 store exit interviews, 709 interviews were conducted.

Exhibit V-A2 gives the impression that the number of interviews administered each wave declined over time. Actually, the number of interviews administered remained relatively constant, at about 106 per wave. The totals for the Initial Store Worksheet and the Pre-Demonstration and the Start-up interviews, however, include sections which were administered during later interview waves to new demonstration participants.

CHECKOUT OBSERVATIONS

Because of the importance retailers place on the issue of checkout productivity, a separate component of the evaluation measured the amount of cashier time required to transact various type of sales. This component, the checkout counter observations, provided the data from which checkout costs were derived.

The observation sample consists of 29 stores which participated in the demonstration and 10 nonparticipating stores in Allentown, Pennsylvania. The sample was divided equally among supermarkets, grocery stores, and convenience stores; stores in the "other" category were not included. Observation sessions were conducted in each store at approximately the same time that the Pre-Demonstration, Early Demonstration, and Late Demonstration interviews were being administered. Observation sessions were composed of 12 thirty-minute segments, during which the observer recorded the following information about each sale:

- number of customers in line at start of order
- number of items in order
- dollar value of purchase
- start/end of ringing time
- unusual circumstances during ringing (produce weighing, price checks, etc.)
- mode of payment (cash, check, manufacturer's coupon, food stamp coupon, EBT card, etc.)
- start/end of payment time

- unusual circumstances during payment (bottle return, items taken out of purchase, etc.)
- start/end of bagging time, and
- type of bagger (cashier, customer, bagger).

To observe as many food stamp transactions as possible, checkout observations were concentrated in the days immediately following benefit issuance. In stores with multiple checkout counters, a random number table was used to select counters for observation. Exhibit V-A3 shows the number of stores and transactions (including all types of transactions) observed by major store type for each wave.

Most of the analysis of checkout observation data is based on the Early and Late Demonstration waves of observation. During this period, the demonstration stores conducted most of their food stamp business through EBT transactions, although some non-demonstration recipients still shopped in these stores using coupons. Most coupon purchases observed during the demonstration period, however, occurred in the comparison stores in Allentown.

Three different observers made checkout observations in the Pre-Demonstration wave, and two in the Early and Late Demonstration waves. The observers in the later waves were two of the original three. Thus there was no difference in observers between the Early and Late Demonstration waves, and only a small difference between those and the Pre-Demonstration wave. At the beginning of each wave, observers were paired so that both could record the same transactions during a test period. Their observations were coded and key items (transaction time; amount of purchase, etc.) were analyzed for inter-rater reliability. Correlations between observers were consistently greater than .95.

DATA ON FOOD STAMP REDEMPTIONS

In the ATP/coupon system, data on food stamp redemptions by retailers come from the Minneapolis ADP Field Center. The Redemption Certificates which accompany each retailer's food stamp deposit yield cumulative data about redemptions. Each month a report lists the following information for each authorized retailer:

- average monthly food sales

Exhibit V-A3

Transactions Observed by Wave by Major Store Type

		Demonstration			Comparison			
	Super- market	Grocery Store	Con- venience Store	Super market	Grocery Store	Con- venience Store		Total
Number of stores	10	10 ^a	10	4	3	3 ^b		39 ^c
Pre-Demonstration transactions	1,607	1,371	2,210	933	287	547		6,955
Early Demonstration transactions	1,446	895	1,498	670	181	543		5,233
Late Demonstration transactions	1,334	965	1,539	619	220	392		5,069
Total transactions	4,387	3,233	5,247	2,222	688	1,482		17,257

^aA grocery store went out of business prior to Late Demonstration observations.

^bA convenience store declined to participate in Late Demonstration observations.

^cThe total for the Late Demonstration wave was 37.

- average monthly redemptions and percentage of food sales per quarter
- monthly redemptions and percentage of food sales for three preceding months, and
- three-month average redemptions and percentage of food sales.

Baseline data about monthly redemptions of food stamp coupons were taken from the September 1984 report; the July-September three-month average was used to correspond with the Pre-Demonstration interviews. Data from calendar years 1984 through 1986 were used to examine changing redemption patterns by store type.

The EBT system provides much more data about food stamp sales. Because the EBT archive file contains information about each sale, it is possible to determine not only the dollar volume of food stamp sales per month per store, but also the number of transactions. To correspond to the Late Demonstration interviews, EBT average monthly sales data from October-December 1985 were used.

APPENDIX V-B

ANALYSIS PROCEDURES

The analysis presented in Chapter 5 has three major components: analysis of retailers' opinions and experiences concerning the EBT system, based on survey responses; analysis of EBT effects on checkout costs, based on checkout counter observations; and analysis of other components of retailer participation cost, based mainly on retailer survey data. (These data sources are described in the preceding section.)

The analysis of opinions and experiences is straightforward. It is generally based on simple univariate distributions of responses to a questionnaire item, broken down by the three major store groups. No imputation or weighting procedures are used.

The other analyses are somewhat more complicated, particularly the analysis of checkout observations. This appendix describes the procedures, focusing first on procedures for the survey-based estimates of participation cost and then on the estimation of checkout cost.

ESTIMATING RETAILER PARTICIPATION COSTS

Food retailers incur costs to participate in the Food Stamp Program. Although they pay no fee to the program itself, retailer personnel must carry out various activities which take time, and they must be paid for this time. Some other resources may also be used, such as checkout counter space or float (unavailability of funds for some time after a food stamp purchase). Exhibit V-B1 identifies the components of retailer participation cost that are analyzed.

With the exception of the checkout cost component, which is discussed in the next section of this appendix, estimates of all of these costs are based on retailer surveys. In initial contacts with retailers, we explored the possibility of obtaining "hard" numbers -- that is, figures from stores' accounting records of actual expenditures. This proved infeasible for two reasons. First, accounting records do not generally identify the specific cost elements of interest here; even if we had access to the records, extensive interviewing would have been necessary to estimate proportions of the

Exhibit V-B1

Comparative System Cost Elements

Coupon System Costs

checkout costs
handling costs
(including reconciliation)
training costs
accounting error costs
float costs
return/reshelving costs

EBT System Costs

checkout costs
handling costs
(including reconciliation)
training costs
accounting error costs
float costs
return/reshelving costs
space costs

where:

checkout costs =	the amount of cashier time required to process each sale, multiplied by cashier wage
handling cost =	the amount of time required to count, bundle, cancel and deposit food stamp coupons and reconcile the account, or the amount of time required to reconcile the EBT account, multiplied by the relevant wage
training costs =	the amount of trainer and trainee time required to instruct new hires in Food Stamp Program regulations and the proper procedures for handling food stamp coupons or EBT cards, multiplied by the relevant wages
accounting error costs =	the dollar value of permanent losses, if any
float costs =	the number of days between the time a food stamp sale is transacted and the time that amount is credited to the store's account, multiplied by the daily interest rate on demand deposits
return/reshelving costs =	the amount of time required to reshelve merchandise which has been returned by customers, or which has been left at the checkout counter because of customers' inability to pay, multiplied by the relevant wage
telephone costs =	the dollar value of message unit charges incurred by those grocers with shared BTT/telephone connections
space costs =	the amount of space occupied by EBT equipment, multiplied by the cost of space per square foot per month

costs corresponding to the components of interest. Second, stores were quite reluctant to make accounting records available, sometimes as a matter of principle and sometimes because of the work involved in assembling the data. Thus, it was decided to rely entirely on interview data.

For the most part, estimates of ATP/coupon costs are based on the Pre-Demonstration wave of interviews (July through September, 1984), while EBT estimates are based on the Late Demonstration interviews (October through December, 1985). The later interviews asked about both ATP/coupon and EBT system costs, and we had initially expected to use these data either to produce estimates for the two systems at the same point in time, or to at least confirm that ATP/coupon costs did not change substantially in the intervening year. Once the EBT system was fully implemented, however, EBT sales accounted for the great majority of most grocers' food stamp redemptions -- 100 percent in some stores. Because the total food stamp redemptions amount to a very small part of most stores' business, coupon redemptions became an almost invisible element. Retailers had difficulty in the later survey estimating the time required for coupon-related activities, and our interviewers felt that some of the responses were not reliable.

ATP/coupon estimates are therefore generally based on Pre-Demonstration data. The estimate for training costs is an exception. New cashiers are trained in food stamp procedures at the same time they are trained in other aspects of their job. Food stamp training time consists of training in general program regulations (e.g., what foods are authorized), specific procedures for coupon purchases, and, where applicable, EBT procedures. Because we were concerned that retailers might not disaggregate general food stamp and coupon-specific time in the Pre-Demonstration survey as they would after EBT operations began, we used Late Demonstration data to estimate training time for both ATP/coupon and EBT costs.

SCALING EBT AND COUPON COSTS FOR COMPARABILITY

Using the cost per month for each cost element and each store in the sample, the average cost per store month was determined for each store type. This measure mixes stores with small and large volumes, however. Moreover, it is subject to bias, because total coupon redemptions in the Pre-Demonstration period were generally greater than EBT-only redemptions during the demonstration.

Stating costs per \$1000 of food stamp benefits used permits more meaningful comparisons between coupon costs and EBT costs. In order to determine the cost per \$1000 of benefits used, the total cost per month for all stores in a group was divided by the total dollar value of benefits exchanged per month by those stores. This procedure has the effect of producing a weighted average of store costs, where each store's cost is weighted by its food stamp volume.¹

For food stamp coupon benefits, figures from July through September 1984 were used; these data came from the monthly FNS report on retailer redemptions. Figures from October through December 1985 were used for EBT benefits; the source of these data was the EBT Center archive tape. Exhibit V-B2 shows the average dollar value of food stamp benefits (coupon and EBT) transacted by major store type for these months.

IMPUTED DATA

In general, the analysis takes the conservative approach of not imputing data where retailers provided no direct response. Imputation was necessary in two cases, however: owner/operator wages in those stores where the individuals did not pay themselves salaries; and space costs where the stores reported something other than normal rent or mortgage arrangement.

Owner-operator wages. A number of stores in the grocery store and "other" store categories are owned and operated by individuals or families. These individuals, although not paid a salary or hourly wage, perform food stamp activities for which a value must be determined. In some instances, owner/operators were able to place a value on their time; the mean of these estimates was \$5.99 per hour. This figure was imputed to owner/operators who were unable to provide estimates, and was used for stores in both the grocery and the "other" category. Retailer interview data from all waves were used in this computation.

¹This procedure was chosen because it reflects total costs to the overall population of participating stores. By giving high-volume stores more weight in the estimate, we may understate the effect on low-volume stores. The largest differences in volume, however, are those between supermarkets and other types of stores. Separate estimates are therefore presented by store type.

Exhibit V-B2

Value of Food Stamp Benefits Redeemed

	Major Store Type				
	Super- market	Grocery Store	Convenience Store	Other	TOTAL
Total Value of Benefits Redeemed Per Month					
Coupons	\$348,351	\$77,594	\$28,934	\$17,707	\$472,586
EBT	265,486	63,733	20,472	9,141	358,832
Average Value of Benefits Redeemed Per Store					
Coupons	\$17,418	\$1,158	\$1,447	\$805	\$3,663
EBT	13,973	1,099	1,077	457	3,093
Number of Stores:					
Coupons	20	67	20	22	129
EBT	19	58	19	20	116

Sources: FNS Monthly Redemption Report, September 1984
EBT Center Archive Tape, November 1985.

Note: Coupon redemptions in November 1985 are not included in EBT totals.

Counter space. Similarly, the value of counter space occupied by EBT equipment was sometimes impossible to measure from interview data. Retailers were asked to report their rent per square foot of selling space per month. Because many grocery stores and other stores are owned by the proprietor, no rent is paid. For some convenience stores, rent is a function of sales volume. Supermarkets, particularly those in malls or shopping centers, also may pay rent on some basis other than a per square foot cost. Thus, it was necessary to impute the value of counter space in some cases.

As in the case of owner/operator wages, the value imputed was the mean of the available rental data for each store type (supermarkets, grocery stores, convenience stores, and other). The resulting values were assigned to all stores within each store type to ensure comparability. Values imputed were \$3.50 per square foot per month for convenience stores, \$1.75 per square foot per month for supermarkets, and \$0.53 per square foot per month for grocery stores and "other" stores.

ESTIMATING CHECKOUT TRANSACTION COSTS

In order to estimate the EBT system's effect on checkout costs, the analysis proceeded through several stages:

- Estimation of regression models showing the extra time that coupon or EBT transactions require, compared to cash payment, in a "routine" purchase (i.e., one with no problems or unusual events);
- Estimation of coupon and EBT purchase time requirements taking into account EBT problems and other non-routine events;
- Estimation of the checkout time for a "typical" purchase with cash, coupons, or EBT payment;
- Converting this time estimate into an estimated cost of the associated cashier time, assuming that all extra time entails extra costs; and
- Adjusting the cost estimates to take into account the fact that some cashier time is "down time," spent waiting for the next customer to arrive.

The following sections present further detail on the procedures. First, we describe the procedures for the basic regression estimates (which are the same for routine and non-routine transactions, the first two steps

above). Each of the remaining three steps is then briefly described in a separate section.

BASIC REGRESSION ESTIMATES

A transaction at the checkout counter involves three phases: ringing, payment, and bagging. Each phase in turn may involve a number of steps (such as price checks or produce weighing or bagging by the cashier) or factors that affect the total time for the transaction (such as the method or methods of payment, and especially the number of items). Because of the large number of combinations, both potential and observed, one cannot determine the typical contribution of a single element (such as use of the EBT card) by comparing substantial groups of observations that differ only in the presence or absence of that element. Instead, regression analysis is used to disentangle the contributions of the major elements. In this framework, the variation in a dependent variable (such as total transaction time) is seen as a sum of contributions, each consisting of an explanatory variable (such as the number of items, the use of the EBT card, or the presence of price checks) multiplied by a coefficient.

These regression analyses focus on two dependent or outcome variables:

- the total time of the transaction, from the start of the order through ringing, paying, and bagging to the end of the order; and
- pay time, from the time that the cashier determines the total amount of the purchase to the time that the customer receives the receipt and change (if any); in an EBT purchase this normally starts with the card swipe and PIN check.

The analysis of total time yields an estimate of the incremental effect of the EBT system (or the coupon system) on the overall checkout process, whereas the analysis of pay time concentrates on the phase where the EBT system should have its most specific effect.

The set of explanatory variables for the regression underwent a number of iterations of diagnosis and refinement. Exhibit V-B3 lists the final set, according to several broad categories. Of greatest importance are the forms of payment. The observations indicate whether the transaction

Exhibit V-B3

Explanatory Variables in The Regression Analyses

Forms of Payment (and Combinations of These)

Constant (represents payment in cash)
EBT card only
EBT card and cash (but no other forms of payment)
All other combinations of payment forms that include the EBT card
Food stamp coupons only
Food stamp coupons and cash (but no other forms of payment)
All other combinations of payment forms that include food stamp coupons
Check
Other coupons
Other form of payment

Variables Involving the Number of Items

Number of items
Number of items, when only cashier does bagging
Number of items, when no bagging takes place

Events During Ringing

Price checks (indicator variable)
Produce weighing (indicator variable)

Other Variables (all indicators)

Presence of a problem with EBT system
Other non-routine circumstances or events
"Long" transaction
"Penny candy" transaction

the corresponding form of payment (or combination of forms) is present in the particular transaction. Three such variables represent checks, other coupons, and other forms of payment.

- EBT card (or food stamp coupons) only;
- EBT card (or food stamp coupons) in combination with cash; and
- all other combinations involving the EBT card (or food stamp coupons).

Two further explanatory variables indicate whether the transaction involved price checks or produce weighing.

If the transaction involved the use of the EBT card, another variable indicates whether any sort of problem related to the EBT system arose.

Finally, three further indicator variables capture special features that would tend to affect the duration of the transaction. One is the presence of any other nonroutine circumstances or events. A second reflects the observer's judgment that the transaction was unduly long for some reason not related to the EBT system. The third identifies a group of transactions that were unusually brief for the number of items involved. These have (by definition) total purchase amounts of less than ten cents per item. It turns out that they consist primarily of penny candy purchases (for example, 25 items for 25 cents).

The regressions for payment time did not include the explanatory variables for bagging, price checks, or produce weighing, because those variables pertain to other phases of the transaction.

The regression analyses presented in Section 5.2 are based on data from the Early and Late Demonstration study periods. The Early Demonstration observations were made in April through June 1985. The Late Demonstration observations, in October through December 1985, aimed to measure the system's performance after all participants had had an opportunity to gain experience and make adjustments.

In order to obtain adequate numbers of observations from the three types of stores (supermarkets, grocery stores, and convenience stores), the checkout observations were not allocated in proportion to the volume of food stamp benefits in each stratum (store type) during the observation periods. Thus, the regression analyses that combined data across store types incorporated weights so as to approximate a random sample from the universe of transactions (without regard to store type). These weights have the effect of giving supermarkets the largest role in overall estimates. Because all observations within a single store type (in each wave) would receive the same weight, the regression analyses within store type do not involve weights.¹

¹ The weights used for the Early Demonstration wave are 427.48 for supermarkets, 243.56 for grocery stores, and 17.05 for convenience stores. In the Late Demonstration period, the weights are 463.16, 221.15 and 18.03, respectively.

Part of the analysis focuses on routine transactions. We define these by requiring that all four of the "other variables" in Exhibit V-B3 take the value 0. That is, a routine transaction (1) involves no problems with the EBT system, (2) does not involve any other nonroutine circumstances of events, (3) is not flagged as "long" by the observer, and (4) does not consist of penny candy.

Exhibit V-B4 through V-B9 present the results of the regression analysis for the three major store types (similar exhibits for the weighted combination of stores are presented in Chapter 5). The first three exhibits present the analysis of total transaction time, and the second three present the analysis of payment time.

Even though some explanatory variables may not be intrinsically interesting, it is important to keep the full set of explanatory variables in mind when interpreting any single coefficient. For example, the coefficient of "EBT card only" tells how much the total time of such a transaction differs (on average) from that of other types of transactions, after allowing for simultaneous change in the other explanatory variables in the model. If one or more of these other variables were not included in the model, the interpretation of the coefficient for "EBT card only" would be different. To minimize such difficulties, we apply the same regression model in both waves. Even so, some explanatory variables may drop out of the model when the circumstances for which they adjust did not arise in any observed transaction. For example, the observations of routine transactions in grocery stores in the Early Demonstration period did not include any that involved food stamp coupons in other combinations (besides alone and with cash).

ESTIMATING AVERAGE TOTAL TRANSACTION TIMES FOR THE TYPICAL TRANSACTION UNDER DIFFERENT MODES OF PAYMENT

The regression coefficients are estimates of the incremental transaction (or payment) time associated with particular payment modes or other transaction characteristics. It is somewhat difficult to see in the coefficients the total time required for a transaction in a typical situation. The next analysis estimates this total.

Exhibit V-B4

Regression Model for Total Time (in Seconds)
Per Routine Transaction in Supermarkets, Early and Late Demonstration

Explanatory Variable ^a	Coefficient from Early Demonstration	Coefficient from Late Demonstration
Constant	16.8***	22.7***
EBT card only	32.4***	36.8***
EBT card and cash	72.6***	93.2***
EBT card, other combination	-17.0	12.2
FS coupons only	12.6*	18.4***
FS coupons and cash	43.8***	91.2***
FS coupons, other combinations	95.9***	48.2***
Check	31.2***	26.3***
Other coupons	13.8***	7.1**
Number of items	3.76***	3.57***
Items, only cashier bagging	1.45***	1.04***
Items, no bagging	-1.61***	-1.95***
Price checks	35.2***	28.5***
Produce weighing	10.1***	13.3***
R ²	0.868	0.836
Number of transactions	(1,960)	(1,869)

^aThese samples did not involve "Other form of payment" in either period.

Source: Checkout observations, Early and Late Demonstration.

Statistical significance: *, P < 0.05; **, P < 0.01; ***, P < 0.005.

Exhibit V-B5

Regression Model for Total Time (in Seconds) per
Routine Transaction in Grocery Stores, Early and Late Demonstration

Explanatory Variable ^a	Coefficient from Early Demonstration	Coefficient from Late Demonstration
Constant	16.7***	14.3***
EBT card only	34.6***	29.7***
EBT card and cash	67.1***	45.0***
EBT card, other combinations	56.2***	68.3***
FS coupons only	8.0	7.3
FS coupons and cash	40.4***	28.0**
FS coupons, other combinations	--	--
Check	10.4*	14.3***
Other coupons	11.3	18.4***
Number of items	4.70***	5.31***
Items, only cashier bagging	1.30***	1.69***
Items, no bagging	-2.17***	-2.72***
Price checks	27.9***	16.9***
Produce weighing	13.4***	5.7*
R ²	0.689	0.746
Number of transactions	(987)	(1,074)

^aThese samples did not involve "Other form of payment" in either period.

Source: Checkout observations, Early and Late Demonstration.

Statistical significance: *, P < 0.05; **, P < 0.01; ***, P < 0.005.

Exhibit V-B6

Regression Model for Total Time (in Seconds) per
Routine Transaction in Convenience Stores, Early and Late Demonstration

Explanatory Variable ^a	Coefficient from Early Demonstration	Coefficient from Late Demonstration
Constant	16.7***	15.9***
EBT card only	45.4***	38.3***
EBT card and cash	27.9***	46.1***
EBT card, other combinations	--	--
FS coupons only	2.6	7.7**
FS coupons and cash	43.4***	28.9***
FS coupons, other combinations	--	--
Check	3.0	2.8
Other coupons	11.9	-6.3
Number of items	5.40***	3.61***
Items, only cashier bagging	-0.94*	1.94***
Items, no bagging	-4.00***	-1.82***
Price checks	9.1*	14.5***
Produce weighing	4.3	13.2
R ²	0.454	0.352
Number of transactions	(1,861)	(1,711)

^aThese samples did not involve "Other form of payment" in either period.

Source: Checkout observations, Early and Late Demonstration.

Statistical significance: *, P < 0.05; **, P < 0.01, ***, P < 0.005.

Exhibit V-B7

Regression Model for Pay Time (in Seconds) per
Routine Transaction in Supermarkets, Early and Late Demonstration

Explanatory Variable	Coefficient from Early Demonstration	Coefficient from Late Demonstration
Constant	21.3***	23.8***
EBT card only	41.7***	23.6***
EBT card and cash	64.4***	37.2***
EBT card, other combinations	24.8*	18.5
FS coupons only	17.2***	21.8***
FS coupons and cash	37.9***	42.7***
FS coupons, other combinations	68.9***	21.0***
Check	37.2***	40.0***
Other coupons	-2.1	-2.0
Number of items	0.37***	0.32***
R ²	0.440	0.435
Number of transactions	(1,909)	(1,832)

Source: Checkout observations, Early and Late Demonstration.

Statistical significance: *, P < 0.05; **, P < 0.01; ***, P < 0.005.

Exhibit V-B8

Regression Model for Pay Time (in Seconds) per
Routine Transaction in Grocery Stores, Early and Late Demonstration

Explanatory Variable	Coefficient from Early Demonstration	Coefficient from Late Demonstration
Constant	14.6***	12.6***
EBT card only	39.0***	36.7***
EBT card and cash	42.5***	23.7
EBT card, other combinations	--	33.6**
FS coupons only	7.9*	4.7
FS coupons and cash	24.2***	--
FS coupons, other combinations	--	--
Check	14.8***	17.9***
Other coupons	2.7	2.4
Number of items	1.52***	1.74***
R ²	0.469	0.440
Number of transactions	(942)	(1,036)

Source: Checkout observations, Early and Late Demonstration.

Statistical significance: *, P < 0.05; **, P < 0.01; ***, P < 0.005.

Exhibit V-B9

Regression Model for Pay Time (in Seconds) per
Routine Transaction in Convenience Stores, Early and Late Demonstration

Explanatory Variable	Coefficient from Early Demonstration	Coefficient from Late Demonstration
Constant	12.4***	12.4***
EBT card only	37.7***	36.1***
EBT card and cash	-5.4	--
EBT card, other combinations	--	--
FS coupons only	4.5*	6.2***
FS coupons and cash	--	30.1**
FS coupons, other combinations	--	--
Check	-0.9	-3.3
Other coupons	10.1	-2.0
Number of items	1.53***	1.65***
R ²	0.287	0.179
Number of transactions	(1,823)	(1,615)

Source: Checkout observations, Early and Late Demonstration.

Statistical significance: *, P < 0.05; **, P < 0.01; ***, P < 0.005.

We may predict the total time for a typical EBT transaction in each type of store and compare the result with the total time that one would expect for the same typical transaction if cash were used. We begin by constructing the typical EBT card transaction. For each explanatory variable in the full regression model, we determine the mean value among EBT card transactions in each type of store. Exhibit V-B10 shows the resulting profiles of these typical transactions. For example, from the Early Demonstration supermarket observations, the typical EBT transaction had 48.5 items. As far as the variables for form of payment are concerned, the typical EBT transaction in a supermarket is a composite: 55 percent EBT card only, 40 percent EBT card and cash, and 4 percent EBT card in other combinations.

Next we substitute these mean values into the corresponding full regression model to obtain the average total time for the typical EBT transaction. To impute the average total time for the same typical EBT transaction using food stamp coupons, we make two changes in the explanatory variables. First, we apply to "FS coupons only," "FS coupons and cash," and "FS coupons in other combinations" the proportions that the sample yields for "EBT card only," "EBT card and cash," and "EBT card in other combinations," respectively. Second, we set the proportion of transactions with EBT problems equal to zero, because such problems cannot occur when the recipient uses coupons.

To impute the average total time for the same typical EBT transaction using only cash, we eliminate the three EBT card terms, set the proportion of transactions with EBT problems equal to zero, and we again eliminate the terms for "check," "other coupons," and "other form of payment." Estimated times based on this procedure are shown in Chapter 5, Exhibit 5-9.

ESTIMATING COSTS PER \$1000 OF BENEFITS SPENT AND COSTS PER STORE PER MONTH

Transaction time differences give a picture of what occurs at the checkout counter. Next it is necessary to translate these time differences into estimates of retailer participation costs. Two measures are of interest: the monthly cost for the average store, and the cost per \$1000 of benefits redeemed.

Exhibit V-B10

Profile of the Typical EBT Transaction for Each Store Type and Wave

	Early Demonstration			Late Demonstration		
	Supermarket	Grocery	Convenience	Supermarket	Grocery	Convenience
EBT card only*	0.55	0.83	0.91	0.38	0.83	0.81
EBT card and cash*	0.40	0.12	0.09	0.58	0.15	0.19
EBT card, other combinations*	0.04	0.05	0	0.05	0.02	0
Check*	0.01	0.02	0	0.02	0	0
Other Coupons*	0.09	0.02	0	0.16	0.02	0
Other form of payment*	0.01	0.01	0	0.16	0	0
Items	48.54	6.36	4.78	46.39	4.65	4.91
Items, only cashier bagging	10.66	5.14	3.83	11.72	4.38	3.75
Items, no bagging	19.02	0.77	0.26	15.81	0.11	0.59
EBT problem*	0.16	0.15	0.20	0.17	0.11	0.12
Candy purchase*	0.02	0.01	0	0	0	0.03
Price check*	0.15	0	0.07	0.06	0	0.03
Produce weighing*	0.25	0.11	0.07	0.30	0.09	0
Other unusual circumstances*	0.13	0.05	0.07	0.05	0.12	0.31
Extra long transaction*	0.08	0	0	0	0	0

Source: Checkout observations, Early and Late Demonstration.

*Each entry gives the mean value for that variable over all EBT transactions in the particular store type and period. For indicator variables, which are denoted by an asterisk, the result is simply a proportion.

In translating checkout transaction times into a cost per \$1000 of food stamp benefits spent and a cost per store per month, the key figure is the cost per transaction. This cost is the product of two numbers: (1) the difference in the time required for a typical EBT or coupon transaction and an equivalent cash transaction and (2) the cashier wage for the particular type of store concerned. The average cashier wage in the demonstration area was \$3.68 in supermarkets, \$3.69 in grocery stores, and \$5.53 in convenience stores. Owner/operators who did not list a cashier wage on the retailer questionnaire were assumed to be working as cashiers themselves and to have a wage of \$5.99, which was the average reported owner-operator wage.

Because time is recorded in seconds and the wage is in dollars per hour, time must be converted to hours. The result will then be expressed in dollars per transaction. Each system's cost per transaction for each store type is listed in Exhibit V-B11.

To find the cost of each system per \$1000 of benefits spent, we multiply the cost per transaction by the number of transactions per \$1000 of EBT or coupon benefits spent. The number of transactions per \$1000 of benefits spent is obtained by taking the total number of transactions and dividing by the total dollars of benefits spent (in thousands). Exhibit V-B12 shows the number of EBT transactions per \$1000 of EBT benefits spent. These figures come from the period August through October 1985, which begins just after the EBT system stabilized and ends just before the Thanksgiving and Christmas shopping months. No comparable numbers are available for the food stamp coupon system, so we assume that the number of coupon transactions per \$1000 of coupons spent is the same as for the EBT system. To determine the cost per store per month, we multiply the cost per transaction by the number of transactions per store per month.

Exhibit V-B13 shows how the cost per transaction and number of transactions are combined to yield a cost per \$1000 of benefits redeemed in each major store type.

ADJUSTING COSTS TO REFLECT LIMITED OPPORTUNITY COSTS

The procedures described above implicitly assume that all transactions entail an opportunity cost -- i.e., that the cashier would be productively engaged on some other task. To test the importance of this assumption,

Exhibit V-B11

Cost per Transaction by Store Type

	Supermarket	Grocery	Convenience
<u>Early Demonstration</u>			
<u>EBT</u>			
Time of typical EBT transaction minus time of typical cash transaction	96.30	74.45	80.60
Wage	3.68	3.69	5.53
Cost per transaction ^a	0.098	0.076	0.124
<u>Coupon</u>			
Time of typical EBT transaction minus time of typical cash transaction	33.50	8.88	3.44
Wage	3.68	3.69	5.53
Cost per transaction ^a	0.034	0.009	0.005
<u>Late Demonstration</u>			
<u>EBT</u>			
Time of typical EBT transaction minus time of typical cash transaction	66.50	36.40	42.05
Wage	3.68	3.69	5.53
Cost per transaction ^a	0.068	0.037	0.065
<u>Coupon</u>			
Time of typical EBT transaction minus time of typical cash transaction	62.90	8.90	8.77
Wage	3.68	3.69	5.53
Cost per transaction ^a	0.064	0.009	0.014

^aCost per transaction = (1/3600) (difference in typical transaction times)
x (wage). Transaction time is calculated in seconds.

Source: Checkout observations, Early and Late Demonstration.

Exhibit V-B12

Transactions per \$1000 of EBT Benefits Spent

	Supermarket	Grocery	Convenience
Transactions	36,046	34,401	9,856
\$ of Benefits Spent	\$866,770.07	\$255,704.01	\$36,503.13
Transactions per \$1000 EBT Benefits Spent	41.6	134.5	270.0

Source: EBT Center records, August - October 1985.

Exhibit V-B13

Retailer Checkout Costs:
Full Cost per \$1000 of Benefits Redeemed

	Supermarket	Grocery	Convenience	All Stores
<u>Early Demonstration</u>				
<u>EBT</u>				
Transactions per \$1000 benefits spent	41.6	134.5	270.0	68.5
Cost per transaction	\$0.10	\$0.08	\$0.12	\$0.09
Cost per \$1000 benefits spent	\$4.09	\$10.26	\$33.43	\$6.31
<u>Coupon</u>				
Transactions per \$1000 benefits spent	41.6	134.5	270.0	68.5
Cost per transaction	\$0.03	\$0.01	\$0.01	\$0.03
Cost per \$1000 benefits spent	\$1.42	\$1.22	\$1.43	\$1.94
<u>EBT-Coupon Difference</u>	\$2.67***	\$9.04***	\$32.00***	\$4.37***
<u>Late Demonstration</u>				
<u>EBT</u>				
Transactions per \$1000 benefits spent	41.6	134.5	270.0	68.5
Cost per transaction	\$0.07	\$0.04	\$0.06	\$0.06
Cost per \$1000 benefits spent	\$2.83	\$5.02	\$17.44	\$3.93
<u>Coupon</u>				
Transactions per \$1000 benefits spent	41.6	134.5	270.0	68.5
Cost per transaction	\$0.06	\$0.01	\$0.01	\$0.05
Cost per \$1000 benefits spent	\$2.67	1.22	\$3.65	\$3.63
<u>EBT-Coupon Difference</u>	\$0.16	\$3.50***	\$3.79***	\$0.30

Source: Checkout observations, Early and Late Demonstration.

Statistical significance: *, $P < 0.05$; **, $P < 0.01$; ***, $P < 0.005$.

Note: Cost per transaction from Exhibit V-B11. Cost per \$1000 was computed before rounding. Hence, the cost per \$1000 is not exactly the product of the figures shown here for transactions per \$1000 and cost per transaction.

we examined the intervals that occurred after food stamp transactions. We assumed that any transaction that was followed by another transaction in 20 seconds or less represents a situation in which a customer was in line. That is, if the cashier had not spent extra time on the food stamp purchase, he or she would have been engaged in handling the next customer's purchase. The 20-second cutoff is necessarily arbitrary, but examination of the data shows that a somewhat shorter or longer interval would yield similar results.¹

The procedure to calculate cost per \$1000 of benefits spent and cost per store per month incorporating the 20-second opportunity cost cutoff is similar to the procedures described in the previous section. The only difference is in calculating the cost per transaction. For the present analysis, we only want to count the cost of those food stamp transactions that are followed by another transaction within 20 seconds. We therefore insert in the calculation a factor that represents the proportion of transactions in each store type that had an opportunity cost, by this definition. The resulting costs per transaction appear in Exhibit V-B14. These are translated into costs per \$1000 in Exhibit V-B15.

¹A retailer might respond to long lines at the checkout counter by opening another checkout lane. In this situation, the procedure used here could underestimate the opportunity cost (20-second intervals could appear even though the store was in fact quite busy).

**Cost Per Transaction Incorporating 20-Second
Opportunity Cost Cutoff**

	Supermarket	Grocery	Convenience
<u>Early Demonstration</u>			
<u>EBT</u>			
Time of typical EBT transaction minus time of typical cash transaction	96.30	74.45	80.60
Cashier wage	3.68	3.69	5.53
% of transactions with opp. cost	0.62	0.44	0.46
Cost per transaction ^a	0.06	0.03	0.06
<u>Coupon</u>			
Time of typical coupon transaction minus time of typical cash transaction	33.50	8.88	3.44
Cashier wage	3.68	3.69	5.53
% of transactions with opp. cost	0.66	0.26	0.44
Cost per transaction ^a	0.02	0.00	0.00
<u>Late Demonstration</u>			
<u>EBT</u>			
Time of typical EBT transaction minus time of typical cash transaction	66.50	36.40	42.05
Cashier wage	3.68	3.69	5.53
% of transactions with opp. cost	0.62	0.36	0.29
Cost per transaction ^a	0.04	0.01	0.02
<u>Coupon</u>			
Time of typical coupon transaction minus time of typical cash transaction	62.90	8.90	8.77
Cashier wage	3.68	3.69	5.53
% of transactions with opp. cost	0.70	0.18	0.38
Cost per transaction ^a	0.05	0.00	0.01

^aCost per transaction = (1/3600) (difference in typical transaction times in seconds) x (wage) x (percent of transactions with opportunity cost).

Source: Checkout observations, Early and Late Demonstration.

Exhibit V-B15

Retailer Checkout Costs:
Limited Opportunity Cost per \$1000 of Benefits Redeemed

	Supermarket	Grocery	Convenience	All Stores
<u>Early Demonstration</u>				
<u>EBT</u>				
Transactions per \$1000 benefits spent	41.6	134.5	270.0	36.1 ^b
Cost per transaction	\$0.06	\$0.03	\$0.06	\$0.09
Cost per \$1000 benefits spent	\$2.55	\$4.53	\$15.50	\$3.32
<u>Coupon</u>				
Transactions per \$1000 benefits spent ^a	41.6	134.5	270.0	31.7 ^b
Cost per transaction	\$0.02	\$0.002	\$0.002	\$0.03
Cost per \$1000 benefits spent	\$0.94	\$0.32	\$0.62	\$0.90
<u>Difference (EBT-Coupon)</u>	\$1.61***	\$4.21***	\$14.88***	\$2.42***
<u>Late Demonstration</u>				
<u>EBT</u>				
Transactions per \$1000 benefits spent	41.6	134.5	270.0	32.2 ^b
Cost per transaction	\$0.04	\$0.01	\$0.02	\$0.06
Cost per \$1000 benefits spent	\$1.76	\$1.79	\$5.02	\$1.85
<u>Coupon</u>				
Transactions per \$1000 benefits spent ^a	41.6	134.5	270.0	30.2 ^b
Cost per transaction	\$0.05	\$0.002	\$0.005	\$0.05
Cost per \$1000 benefits spent	\$1.88	\$0.22	\$1.38	\$1.60
<u>Difference (EBT-Coupon)</u>	\$-0.12	\$1.57***	\$3.64***	\$0.25

^aTransactions per \$1000 EBT benefits spent used for both card and coupon calculations, because no comparable numbers are available for coupon transactions.

^bTransactions involving opportunity cost per \$1000 of (EBT) benefits spent. (The weighting across store types makes it preferable to adjust for the limited share of opportunity cost at this stage in the calculation rather than in the cost per transactions. Hence, the cost per transaction shown in this column is not comparable with the figures in other columns.

Source: Checkout observations, Early and Late Demonstration.

Statistical significance: *, P < 0.05; **, P < 0.01; ***, P < 0.005.

APPENDIX VI

APPENDIX VI-A

DATA SOURCES FOR RECIPIENT ANALYSIS

We used three principal data sources to assess the EBT system's effects on recipients: the active case survey, the closed case survey, and participation records from the Pennsylvania Department of Public Welfare (PDPW) computer files. This appendix describes each data source.

ACTIVE CASE SURVEY

Most of the analysis of the EBT system effects on recipients is based on interview data collected from individuals who received food stamp benefits during the demonstration. The research uses a modified pre-test/post-test design with a demonstration group of recipients who used the EBT system and a comparison group who continued using the coupon system. The design can be characterized as follows:

	BASELINE MEASURE	INTRODUCTION OF EBT SYSTEM	DEMONSTRATION PERIOD MEASURES	
	Aug. & Sept. 1984	Oct. 1984	Feb. & March 1985	Aug. & Sept. 1985
Demonstration group	0 ₁	X	0 ₂	0 ₃
Comparison group	0 ₁		0 ₂	0 ₃

One wave of interviews was conducted prior to the introduction of the EBT

system (0₁) and two waves during the demonstration (0₂ and 0₃). The Pre-Demonstration interviews provided baseline measures of the variables of interest, such as the problems recipients experienced and their costs of partici-

Because recipients were not randomly assigned to demonstration and comparison groups, any observed differences might be the result of differences between the two groups. We conducted two tests, described in detail in Appendix VI-D, and concluded that there were no systematic differences.

The first sample of EBT system participants was randomly selected from all households living in the demonstration area who received food stamps in the month the survey began. The Early and Late Demonstration samples included all respondents interviewed in the previous survey. To make these later samples represent the full caseload at the time of the survey, the samples also included households who had recently begun receiving benefits and a group of households that received benefits during the previous interview wave but had not been randomly selected for the first wave.

The demonstration area encompasses a four ZIP Code area in central Reading. We selected the comparison area on the basis of two considerations. First, the area had to be close to the demonstration area, and second, the households in the comparison area had to match as closely as possible households in the demonstration area. Factors used in matching were racial or ethnic background and receipt of public assistance benefits.¹ Because none of the areas outside Reading had as high a proportion of black households as the central Reading demonstration area, however, it was not possible to match the demonstration and comparison areas on this characteristic. Black households in the comparison area were oversampled to achieve a comparable racial distribution in the demonstration and comparison samples. Those in the comparison group all lived in a six ZIP Code area surrounding the demonstration area.

Exhibit VI-A1 shows the sample sizes and response rates for all three survey waves, separately for the demonstration and comparison groups. Approximately 560 respondents were interviewed in each of the three survey waves, half in the demonstration group and half in the comparison group. The response rate in Pre-Demonstration was 65 to 68 percent. The rate increased to about 80 percent in Early Demonstration and to 85 to 90 percent in Late Demonstration, because many of those interviewed had been interviewed in the previous survey. Response rates were higher for those previously contacted

¹We also considered using education and household size as factors, but there were no systematic variations among areas in Reading.

Exhibit VI-A1

Sample Sizes and Response Rates:
Active Case Surveys

		<u>Number Surveyed</u>	<u>Response Rate^a</u>
Pre-Demonstration:	Demonstration Group	286	65%
	Comparison Group	285	68%
Early Demonstration:	Demonstration Group	279	79%
	Comparison Group	283	80%
Late Demonstration:	Demonstration Group	286	85%
	Comparison Group	279	90%

^aNumber surveyed divided by total sample drawn.

Source: Pre-Demonstration, Early Demonstration, and Late Demonstration active case surveys.

because we had current telephone numbers for them. The primary circumstances for non-response were that the respondent had moved, could not be located, or there was no contact information.

Respondents in the demonstration and comparison groups were fairly similar on measured demographic characteristics, as Exhibit VI-A2 illustrates. The demonstration group had a slightly higher percentage of small households, college-educated recipients, and male-headed households than did the comparison group. These differences, however, are too small to affect our analysis.

CLOSED CASE SURVEY

Respondents to the two closed-case surveys participated in the Food Stamp Program in the months immediately prior to, or immediately after, the start of the demonstration, but then left the program. They all lived in the demonstration area and thus used the EBT system for some length of time, or would have used it had they remained in the program. The rationale for conducting the surveys was to examine whether the demonstration caused some people to stop participating in the program.

We conducted two waves of interviews with closed cases. The first included food stamp recipients who left the program in the five months prior to the start of the demonstration, or between June and October 1984. This survey provided a baseline measure of how many closures were related to problems with the ATP/coupon issuance system. In addition, because many recipients knew the demonstration was to begin in the fall, the Pre-Demonstration survey was used to determine whether negative expectations concerning the demonstration caused some people to withdraw from the program.

Respondents in the Early Demonstration survey left the Food Stamp Program in the six months after the start of the demonstration, or between October 1984 and March 1985. This survey provided data to analyze why recipients left the program and whether the EBT system was partly responsible. The data also allow us to examine whether recipients who left the program had any more difficulties with the EBT system than those who stayed (as measured in the active case surveys).

Exhibit VI-A2

**Demographic Characteristics of Respondents:
Demonstration and Comparison Groups**

	<u>Pre-Demonstration</u>		<u>Early Demonstration</u>		<u>Late Demonstration</u>	
	Demon- stration Group (N=286)	Comparison Group (N=285)	Demon- stration Group (N=279)	Comparison Group (N=283)	Demon- stration Group (N=285)	Comparison Group (N=279)
<u>Race</u>						
White	53.8%	48.8%	50.5%	48.1%	48.4%*	41.9%*
Black	18.5	19.3	12.5	17.3	20.4	20.8
Other	27.6	32.0	36.9	34.7	31.2	38.3
<u>Language</u>						
English	73.8	74.0	66.3	72.1	73.1	68.5
Other	26.2	26.0	33.7	27.9	26.9	31.5
<u>Public Assistance</u>						
Received PA	50.3	49.1	49.5	50.5	52.8	55.0
Did Not Receive PA	49.7	50.9	50.5	49.5	47.2	45.0
<u>Age</u>						
Less than 40	56.7	55.9	60.3	56.9	56.5	56.1
40-59	22.7	23.5	23.3	25.4	26.7	25.9
60+	20.6	20.7	16.5	17.6	16.9	18.0
<u>Education</u>						
Less than 9 years	32.4	30.7	29.1	29.0	29.7	28.5
9-12 years	60.1	66.3	64.1	66.0	64.8	67.2
13+ years	7.2*	2.9*	6.8	5.1	5.5	4.4
<u>Household Size</u>						
1-2	48.6*	39.6*	38.4	38.9	44.1*	35.6*
3-4	32.5	39.3	37.6	39.9	35.5	42.9
5+	18.7	21.1	24.0	21.2	20.2	21.7
<u>Sex</u>						
Female	84.3	89.8	84.2*	92.2*	82.9*	92.0*
Male	15.7	10.2	15.8*	7.8*	17.1*	8.0*

Source: Pre-Demonstration, Early Demonstration, and Late Demonstration active case surveys.

*Percent in demonstration and comparison groups significantly different at 0.05 level.

In order to get a sufficiently large number of respondents, we drew a "rolling sample," in which sampling and interviews occurred over a five or six month period. In the first month of the Pre-Demonstration survey, we interviewed individuals who had received food stamps in April 1984 but not in May or June 1984. Each month's sample was randomly drawn from all households that were closed in the specified month and stayed closed in the subsequent two months. The final month of the Pre-Demonstration interviews occurred in October 1984. The second interview wave began with those who received food stamps in September 1984 but not in October or November. Similar samples were drawn in each of the following five months. The last interviews were conducted with households that received benefits in February 1985, but not in March or April.

Response rates in the closed case surveys were below rates in the active case survey as Exhibit VI-A3 shows. Not surprisingly, it was more difficult to locate individuals in the closed case samples, as at least 30 percent had moved since last receiving food stamps. We had no contact information or could not locate an additional 10 to 20 percent of the samples.

Exhibit VI-A4 presents data on the demographic characteristics of the closed case survey respondents in Pre-Demonstration and Early Demonstration. The respondents have slightly different characteristics from those of the active case survey respondents shown in Exhibit VI-A2. A somewhat higher percentage of closed case respondents were English-speaking and in male-headed households, compared with the active case respondents. Closed case respondents were also somewhat more highly educated. (The comparisons based on household size were mixed.) It seems likely that these differences reflect a greater ability on the part of recipients with these characteristics to find employment or other sources of income to enable them to leave the Food Stamp Program.

PARTICIPATION RECORDS

The Pennsylvania Department of Public Welfare provided data on all households that received food stamp benefits in Berks County during the months between March 1984 and January 1986. These data allow analysis of how the food stamp caseload changed during the demonstration period. Each household had a unique identification number, so the data can be linked over time to

Exhibit VI-A3

**Sample Sizes and Response Rates:
Closed Case Survey**

	Number Surveyed	Response Rates ^a
Pre-Demonstration	166	30%
Early Demonstration	259	46%

^aNumber surveyed divided by total sample drawn.

Source: Pre-Demonstration and Early Demonstration closed case surveys.

Exhibit VI-A4

Demographic Characteristics of Respondents In Closed Case Survey

	Pre-Demonstration (N = 166)	Early Demonstration (N = 259)
<u>Race</u>		
White	59.4%	54.8%
Black	18.2	17.0
Other	22.4	28.2*
<u>Language</u>		
English	83.0*	76.8*
Other	17.0*	23.2*
<u>Age</u>		
Less than 40	60.0	62.6
40-59	24.2	19.5
60+	15.8	18.0
<u>Education</u>		
Less than 9 years	20.6*	25.0
9-12 years	71.8*	63.7
13+ years	8.1	11.2
<u>Household Size</u>		
1-2	37.9*	54.4*
3-4	42.9*	31.7
5+	19.3	13.8*
<u>Sex</u>		
Female	70.3*	67.7*
Male	29.7*	32.3*

Source: Pre- and Early Demonstration closed case survey.

Statistical significance (closed vs. active [see Exhibit VI-A2] case survey): *, P < 0.05.

calculate closure rates for each month. These data on caseload and closure rates are used to determine whether more people left the Food Stamp Program, or fewer entered, during the EBT demonstration. In addition, since the data indicate the recipients' geographic residence, changes in caseload and closure rates can be examined separately for the demonstration area, comparison area, and the remainder of Berks County. There was an average of 3,500 food stamp recipients in the demonstration group, 800 in the comparison group, and 1,200 in the rest of Berks County during each month of the period.

APPENDIX VI-B
SUPPORTING EXHIBITS FOR CHAPTER 6

Exhibit VI-B1

Expectations about EBT System Prior to Start of Demonstration
by Selected Demographic Characteristics

Expectations	Race			Public Assistance Recipient ^a	
	White	Black	Other	Yes	No
<u>Demonstration Group</u>					
Will make Food Stamp Program better	48.0%*	27.9%*	47.6%*	38.9% ⁺	50.5% ⁺
Will make program worse	19.5	25.6	19.0	25.4*	14.6*
Won't make any difference	17.1	23.3	15.9	18.3	17.5
No opinion	15.5	23.3	17.5	17.5	17.5
(Number of Respondents)	(123)	(43)	(63)	(126)	(103)
<u>Comparison Group</u>					
Will make Food Stamp Program better	40.7	28.1	25.0	31.3	35.4
Will make program worse	15.1 ⁺	31.3 ⁺	31.7	30.2*	15.8*
Won't make any difference	20.9	28.1	21.7	21.9	23.2
No opinion	23.3	12.5	21.7	16.7	25.6
(Number of Respondents)	(86)	(32)	(60)	(96)	(82)

^aNon-public assistance recipients include households receiving no public assistance, households receiving social security or SSI, and households in which some members received food stamps and others received public assistance.

Source: Pre-Demonstration active case survey.

Statistical significance, differences among groups: +, P < 0.10; *, P < 0.05.

Exhibit VI-B2

Reasons For Expecting EBT System To Be Better Than Coupon System

Reason	Demonstration Group (N=112) ^a	Comparison Group (N=68) ^a
Will stop abuse of coupons ^b	34.8%	41.2%
Will prevent theft	17.9	8.8
Won't lose benefits	15.2	11.8
Will need fewer trips to the bank	15.2	10.3
Will be easier to use at the checkout counter	4.5	7.4
Will make shopping quicker	3.6	8.8
Will cause less embarrassment	1.8	1.5
Will have accurate record of transactions	1.8	1.5
No identity problem with picture ID	4.5	1.5
Other ^c	0.9	7.4

^aIncludes only those who expected the EBT system to be better than the coupon system. Total number of responses; 6 demonstration group and 9 comparison group recipients gave more than one answer. Only those who expected the EBT system to be better than the coupon system answered this question.

^bAbuse of coupons includes the practice of selling coupons for cash and using coupons to purchase non-food items.

^cIncludes: availability of benefits on 1st of month; won't need coupons.

Source: Pre-Demonstration active case survey.

Exhibit VI-B3

Reasons for Expecting EBT System to Be
Worse than Coupon System

	Demonstration Group (N=52) ^a	Comparison Group (N=46) ^a
Will be confusing ^b	40.4%	37.0%
Will limit choice of stores	34.6	43.5
Will be less convenient and harder to use	11.5	15.2
Problems with computers	5.8	2.2
Will be difficult to send other shoppers	3.8	2.2
Other	3.8	0.0

^aIncludes only those who expected the EBT system to be worse than the coupon system. Total number of responses; 6 demonstration group recipients and 4 comparison group recipients gave more than one answer. Only those who expected the EBT system to be worse than the coupon system answered this question.

^bIncludes: difficulty keeping track of balances; difficulty with PIN.

Source: Pre-Demonstration active case survey.

Exhibit VI-B4

Reason for System Preference: Late Demonstration Survey Respondents^a

	Percent
<u>Reason for preferring EBT system (N=160)</u>	
Quicker or easier at checkout	38.8%
Less chance of loss or theft	21.3
No need to go to the bank or wait for the mail	17.5
Less cumbersome and hassle ^b	13.8
Less chance of fraud	6.3
Other	2.5
<u>Reasons for preferring coupons (N=43)</u>	
Faster or easier at checkout	44.2%
Familiar with coupons	11.6
Easier to keep track of balance	11.6
Get cash change with coupons	9.3
No wait for account to be credited ^c	7.0
Machine slowness and downtime causes problems	7.0
Other	9.3

^aWe asked this question only in the Late Demonstration survey.

^bLess hassle because you don't have to count coupons or tear them out of the books.

The problem of miscounting coupons is eliminated.

^cThis is more a perceived problem than a real one. With coupons, recipients know they have received their benefits because they have them in-hand.

Source: Late Demonstration active case survey, demonstration group.

System Preference of Program Participants, by Demographic Characteristics:
Early and Late Demonstration

Demographic Characteristic	Early Demonstration				Late Demonstration			
	Prefer EBT	Prefer Coupons	Don't Know	Number of Respondents	Prefer EBT	Prefer Coupons	Don't Know	Number of Respondents
<u>Language</u>								
English	74.3%	23.0%	2.6%	152	76.3%	16.0%	7.7%	169
Other	72.9	17.1	10.0	70	80.8	19.2	0	52
<u>Handicap</u>								
Yes	61.0*	28.8 ⁺	10.2	59	86.8*	7.6 ^{b*}	5.7	53
No	78.5*	18.4 ⁺	3.1	163	74.4*	19.6*	6.0	168
<u>Age</u>								
Less than 30	75.4 ⁺	20.0 ⁺	4.6	65	71.7	25.0*	3.3	60
30-49	78.9 ⁺	16.7 ⁺	4.4	90	83.0	15.9	1.1	88
50 and older	65.7 ⁺	28.4 ⁺	6.0	67	75.0	11.1 ^{c*}	13.9	72
<u>Education</u>								
Less than 9 years	67.6	23.5	8.8	68	81.2	15.9	2.9	69
9-12 years	77.7	18.7	3.6	139	75.4	18.1	6.5	138
13 years and over	71.4	28.6	0	14	75.0	8.3	16.7	12
<u>Race</u>								
White	77.6 ⁺	20.7	1.7	116	80.0	13.0	7.0	115
Black	64.3 ⁺	28.6	7.1	28	70.0	22.5	7.5	40
Other	71.8	19.2	9.0	78	76.9	20.0	3.1	65
<u>Public Assistance^a</u>								
Yes	70.8	24.5	4.7	106	73.2	23.2	3.6	112
No	76.7	18.1	5.2	116	81.7	10.1	8.3	109
<u>Sex</u>								
Female	74.1	21.1	4.9	185	76.9	16.7	6.5	186
Male	72.2	22.2	5.6	36	80.0	17.1	2.9	35

^aNon-public assistance recipients include households receiving no public assistance, households receiving social security or SSI, and households in which the public assistance and food stamp cases are not congruent.

^bDifference between Early and Late Demonstration for handicapped persons significant at 0.05 level.

^cDifference between Early and Late Demonstration for 50+ significant at 0.05 level.

Source: Early and Late Demonstration active case surveys, demonstration group.

Statistical significance, difference between groups: +, $P < 0.10$; *, $P < 0.05$.

Exhibit VI-B6

Ease of Food Shopping under EBT and Coupon System
for Program Participants by Demographic Group

Demographic Characteristic	Early Demonstration				Late Demonstration			
	Makes Shopping Easier	Makes Shopping Harder	About the Same	Number of Respondents	Makes Shopping Easier	Makes Shopping Harder	About the Same	Number of Respondents
<u>Language</u>								
English	64.7%	13.9%	21.4%	173	61.1%	11.1%	27.9%	172
Other	48.8	13.1	38.1	84	50.0	11.5	38.5	52
<u>Handicap</u>								
Yes	50.0	24.2	25.8	62	66.7	5.6	27.8	54
No	62.6	10.3	27.2	195	55.9	12.9	31.2	170
<u>Age</u>								
Less than 30	66.2	10.4	23.4	77	49.2	11.5	39.3	61
30-49	58.3	12.0	29.6	108	61.1	13.3	25.6	90
50 and older	54.2	19.4	26.4	72	62.5	8.3	29.2	72
<u>Education</u>								
Less than 9 years	44.7	19.7	35.5	76	59.4	7.2	33.3	69
9-12 years	66.0	9.9	24.1	162	57.4	13.5	29.1	141
13 years and over	66.7	16.7	16.7	18	66.7	8.3	25.0	12
<u>Race</u>								
White	68.7	14.2	17.2	134	60.7	12.8	26.5	117
Black	48.5	12.1	39.4	33	58.5	7.3	34.2	41
Other	50.0	13.3	36.7	90	54.5	10.6	34.8	66
<u>Public assistance</u>								
Yes	54.4	14.4	31.2	125	52.6	14.9	32.5	114
No	64.4	12.9	22.7	132	64.5	7.3	28.2	110
<u>Sex</u>								
Female	59.3	13.9	26.9	216	57.7	11.1	31.2	189
Male	62.5	12.5	25.0	40	62.9	11.4	25.7	35

Source: Early and Late Demonstration active case surveys, demonstration group.

Exhibit VI-87

Problems Of Lost Or Delayed Benefits And
Grocers' Errors: ATP Comparison Group

	Early Demonstration (N=283)			Late Demonstration (N=279)		
	Number experiencing problem	Total number of incidents	Average value of benefits involved	Number experiencing problem	Total number of incidents	Average value of benefits involved
<u>Problem</u>						
ATP card late	29	50	\$144.21 ^a	11	19	\$118.82 ^a
ATP card had less benefits than supposed to receive	6	8	11.17	10	21	24.44
ATP card stolen	2	2	55.50	0	0	0
ATP card lost	6	8	102.50	8	9	123.00
ATP card damaged ^b	0	0	0	2	2	132.00
Received less coupons than on ATP card	7	8	16.57	0	0	0
Coupons not at bank ^c	12	16	122.75 ^a	2	2	46.50 ^a
Coupons lost	9	11	72.88	8	8	56.63
Coupons stolen	9	10	83.25	4	5	32.00
Cashier overcharged	22	52	6.45	12	22	5.70

^aRepresents average value of monthly issuance.

^bSo they could not redeem for coupons; had to get new card.

^cBanks sometimes ran out of coupons and had to get a new supply.

Source: Early and Late Demonstration active case surveys, comparison group.

Exhibit VI-88

Problems of Lost or Delayed Benefits and Grocers' Errors:
EBT Demonstration Participants

Problem	Early Demonstration (N=279)			Late Demonstration (N=286)		
	Number experiencing problem	Total number of incidents	Average value of benefits involved	Number experiencing problem	Total number of incidents	Average value of benefits involved
Benefits credited to account late	16	24	\$131.75 ^a	17	25	\$122.59 ^a
Less benefits credited to account	16	19	\$19.53	6	8	19.50
EBT card stolen	1	1	116.00 ^a	4	4	115.75 ^a
EBT card lost	10	10	113.80 ^a	22	22	108.14 ^a
EBT card damaged	22	23	123.27 ^a	35	45	135.85 ^a
Benefits stolen from account	2	2	31.00	0	0	0
Cashier deducted too much	4	4	16.33	3	3	17.92
Cashier overcharged for groceries not purchased	1	1	20.00	4	4	16.75

^aThis is the average value of total monthly insurance received and is thus the maximum amount of benefits involved.

Source: Early and Late Demonstration active case surveys, demonstration group.

Exhibit VI-B9

Problems Requiring Trips To The Bank Or Welfare
Office: ATP Comparison Group

	Early Demon- stration (N=283)	Late Demon- stration (N=279)
Number who made at least one trip to the bank to deal with problems	21	23
Average number of trips	1.67	1.13
Average length of time at bank, in minutes	13.8	22.0
Number who made at least one trip to the welfare office to deal with problems	27	17
Average number of trips	1.38	1.11
Average length of time at welfare office, in minutes	40.0	30.0

Source: Early and Late Demonstration active case surveys, comparison group.

Exhibit VI-B10

Problems Requiring Trips to the Welfare Office:
EBT Demonstration Participants

	Early Demon- stration (N=279)	Late Demon- stration (N=286)
Number who made at least one trip to the welfare office to deal with problems	29	41
Average number of trips	1.45	1.58
Average length of time at welfare office, in minutes	34.5	34.7

Source: Early and Late Demonstration active case surveys, demonstration group.

EXHIBIT VI-B11
FOOD STAMP CASELOAD IN BERKS COUNTY

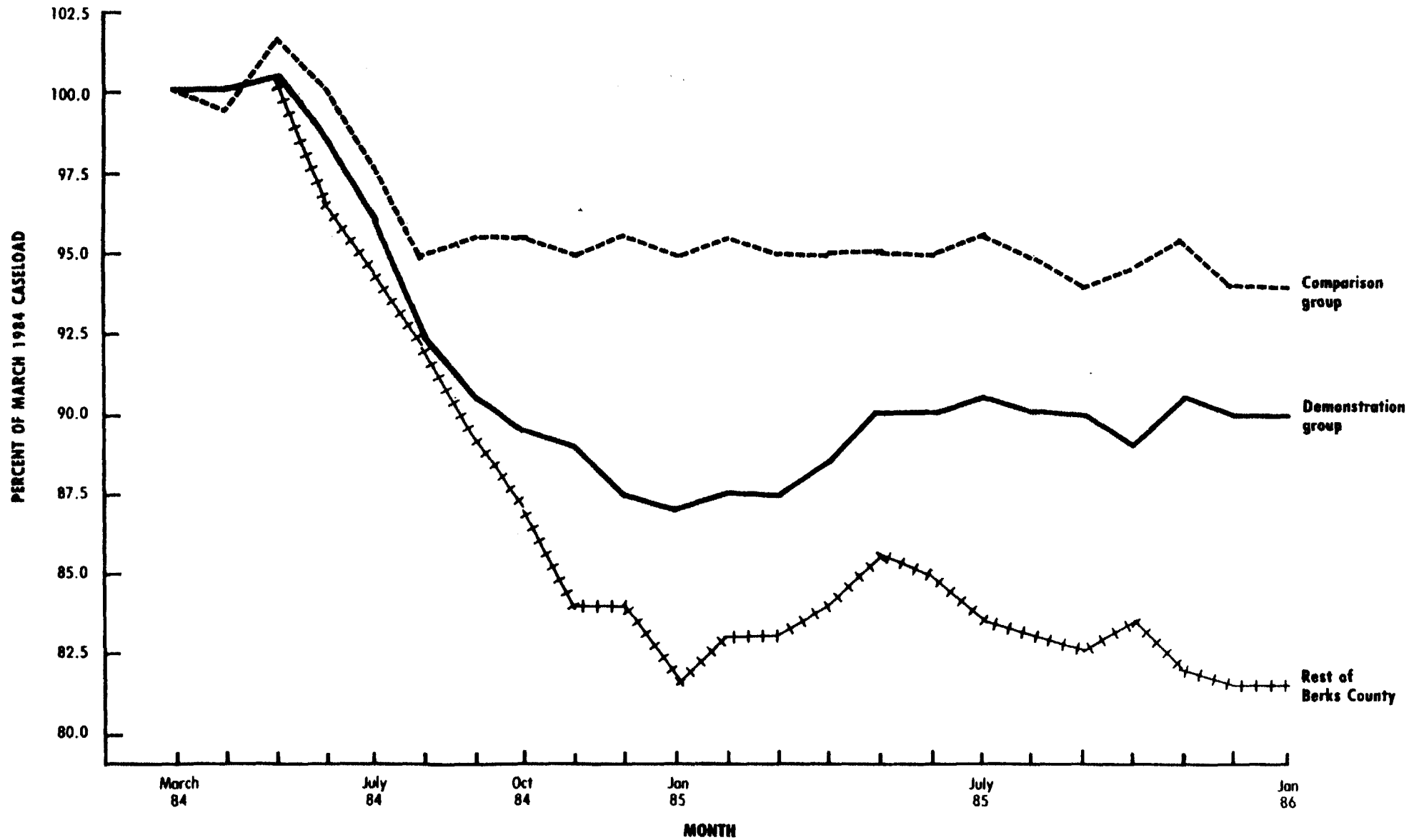
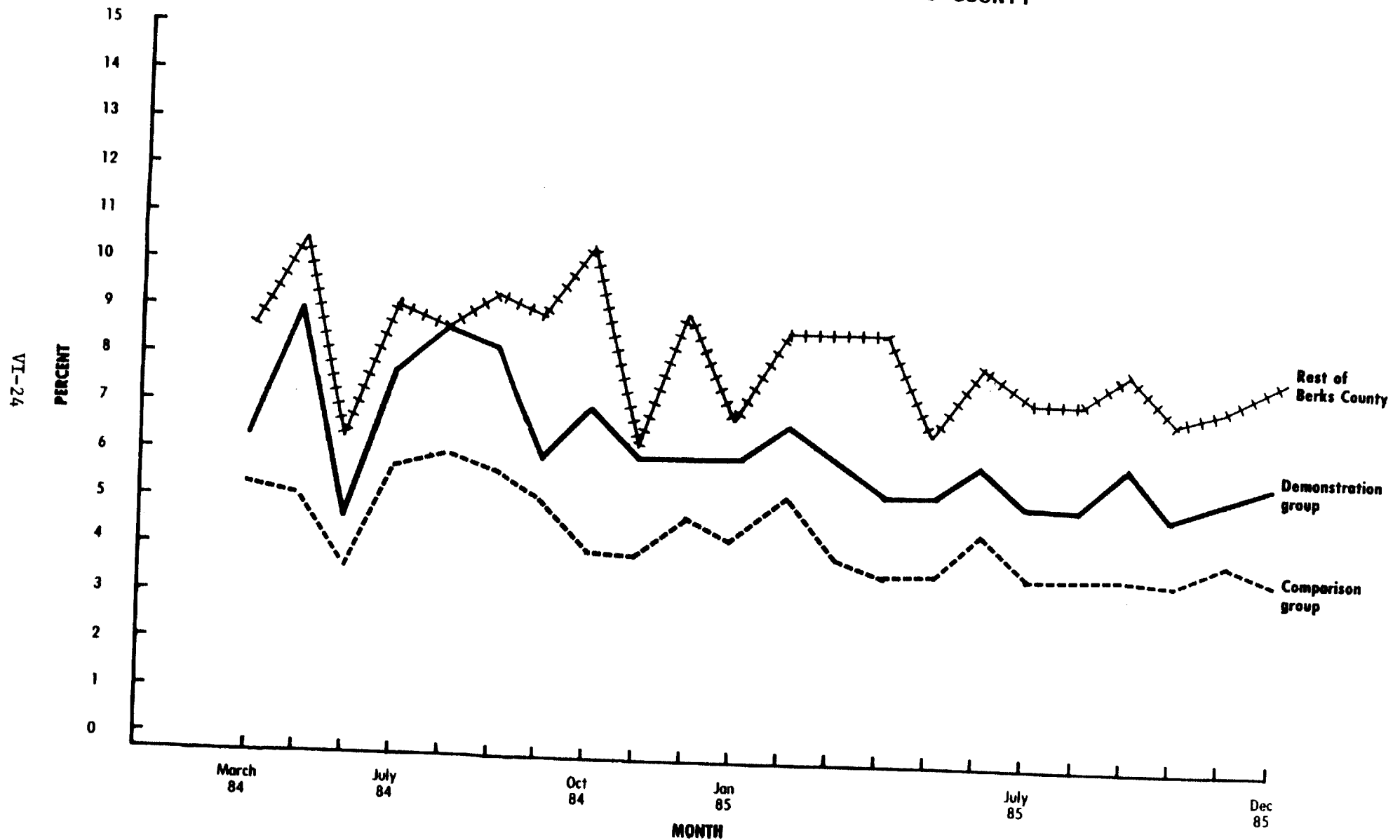


EXHIBIT VI-B12
FOOD STAMP CASE CLOSURE RATES IN BERKS COUNTY



APPENDIX VI-C

PROCEDURES TO ESTIMATE COSTS OF PARTICIPATING IN THE FOOD STAMP PROGRAM

PROCEDURES FOR ESTIMATING COSTS OF OBTAINING BENEFITS

There are two types of costs recipients incur in obtaining their food stamp benefits, out-of-pocket expenses and time costs.

Out-of-pocket expenses fall into two categories: transportation costs and child care costs. The surveys asked respondents how much they spent on travel and child care each time they went to the welfare office. Out-of-pocket expenses are estimated as the mean cost that the respondents reported.

Similarly, recipient responses provide the basis for estimating the time required to travel to the welfare office or the bank and the time spent there. In order to estimate participation costs, we need to place a value on the time spent. We have used two different values. In one estimate we valued respondents' time at the federal minimum wage of \$3.35 per hour. While recipients might earn more if they worked, typically most recipients were not actually losing wages during the time they spent at the B CAO or the bank. This is a simple and readily understandable value and probably provides a maximum on the value of recipients' time.

The second value we used reflects the actual earnings of Food Stamp recipients in Pennsylvania. Using the Quality Control (QC) data collected by FNS, we calculated the total 1984 earnings for the heads of households that received food stamps. The mean monthly income was \$400. This estimate includes the 88 percent of households who had no earnings, and thus reflects the probability that a household head will have worked at all. Converting monthly to hourly earnings (using 172 hours per month), we estimate that recipients earned \$0.28 per hour. This is the second figure we used to calculate the value of recipients' time.

Thus, for the comparison group that used the ATP/coupon system, the monthly cost of obtaining their benefits is the sum of the out-of-pocket expenses they incur going to the bank and value of the time they spend traveling and at the bank.

Estimating the EBT recipients' costs of obtaining benefits involves

after being deemed eligible for benefits. Some recipients, however, ended up making more than one trip, because, for example, they showed up late for the training session. Approximately two-thirds of the demonstration participants made only one trip, and the rest made two or more, the overall average being 1.5 trips. Travel time and costs are estimated for a single trip. Total travel costs were derived by multiplying the single-trip estimate by the number of trips the respondent had to make.

Second, the objective is to estimate the recipients' participation costs each month that they are receiving benefits. Since the cost of obtaining an EBT card is usually a one-time cost, we amortized the cost of the initial visits over the average span in the program. Specifically, we multiplied the cost by the average monthly rate of new approvals from March 1984 through December 1985, which was 5.73 percent.¹ This effect assumes that the average case received benefits for 17.5 months.

PROCEDURES FOR ESTIMATING OPPORTUNITY COSTS OF LOST AND DELAYED BENEFITS

Lost benefits or permanent losses are valued at the amount the respondent reports as lost. Thus, if a participant received less benefits than he or she should have and never got the problem fixed, or if a recipient had benefits stolen, the loss is considered permanent and valued at the amount of the benefits lost. Because the surveys asked recipients to report all incidents that had occurred in the previous six months, the average value of a single event is multiplied by one-sixth of the reported frequency of events to

delayed benefits, adjusted for the length of the delay, and then multiplied by the relevant interest rate. We have used an annual interest rate of 18 percent, a common rate for unsecured consumer credit.

PROCEDURES FOR ESTIMATING COSTS OF DEALING WITH PROBLEMS

Some recipients made trips to the bank and the welfare office to deal with problems that arose, including lost and delayed benefits. The procedures for calculating these costs are similar to the calculations for the costs of obtaining benefits, and cover out-of-pocket expenses and time required. The surveys asked recipients about the number of trips they made in the six months prior to the survey. We converted cost estimates to represent average monthly costs.

APPENDIX VI-D

TESTS FOR POTENTIAL ERRORS DUE TO NON RANDOM ASSIGNMENT TO DEMONSTRATION AND COMPARISON GROUPS

The estimates in Chapter Six and summarized in Exhibit 6-14 are based on simple comparisons of the average responses to the Early and Late Demonstration surveys. Because recipients were not randomly assigned to demonstration and comparison groups, the observed differences could result in part from differences in the two recipient groups.

We conducted two tests to determine whether some systematic differences between the demonstration and comparison groups might bias the cost estimates. The first test involves comparing the estimated monthly costs of participating in the Food Stamp Program for the demonstration and comparison groups in the Pre-Demonstration survey, when both groups used the coupon system. The second test uses regression analysis to analyze the observed variation in monthly costs across all respondents in the Late Demonstration survey. This analysis treated total monthly costs as the dependent variable. Explanatory variables included whether the household used the EBT system. This analysis provides an estimate of the EBT system's effect on recipients' costs, holding constant all measured background characteristics.

The results of both tests confirm the finding that participants' costs of using the EBT system are less than the costs of using the ATP/coupon system.

Exhibit VI-D1 shows the monthly participation costs in Pre-Demonstration when both the demonstration and comparison groups used the coupon system. The total expenses for both groups are quite similar--approximately \$5 per month--and the observed differences are not statistically significant. Components of total costs are also similar in both groups. Because the monthly costs of the demonstration and comparison groups are similar in the Pre-Demonstration period, the observed differences between the two groups in Early and Late Demonstrations can be attributed to the EBT system.

The regression analysis also supports the basic findings. Exhibit VI-D2 presents the results of the analysis. Demographic characteristics, by themselves, explained little of the variation in participation costs, only

Exhibit VI-D1

Monthly Costs Of Participating In The Food Stamp Program: Pre-Demonstration Respondents^a

	Demonstration Group (N=285)	Comparison Group (N=285)
Total costs of obtaining benefits	\$3.71* (2.57)	\$4.57* (3.00)
Opportunity costs of lost or delayed benefits ^b	0.94 (4.42)	0.38 (2.59)
Costs of dealing with problems	0.15 (0.58)	0.17 (0.65)
Total costs per month of program participation	\$4.80 (5.65)	\$5.12 (4.31)

^a Numbers are the means across the sample. Standard deviations are in parentheses.

^b See note c, Exhibit 6-14.

Source: Pre-Demonstration active case surveys.

Statistical significance: *, $P < 0.05$.

Exhibit VI-D2

Regression Of Monthly Participation Costs
On Household Characteristics And Participation
In EBT Demonstration: Late Demonstration Respondents (N=558)

Explanatory Variables	Coefficient (Standard Error)	
	Equation 1 (Household characteristics only)	Equation 2 (Adds EBT dummy)
Race:		
Black	0.66 (0.44)	0.40 (0.38)
Other nonwhite	0.61 (0.68)	0.10 (0.59)
Handicapped	0.70 (0.40)	0.24 (0.34)
Over 60 years old	-0.33 (0.50)	-0.50 (0.43)
Received public assistance	0.25 (0.36)	0.09 (0.31)
Education:		
0-8 years	-0.23 (0.39)	-0.02 (0.34)
13+ years	-0.69 (0.78)	-0.64 (0.67)
Non-English speaking	0.51 (0.68)	0.62 (0.59)
Male	-1.30* (0.49)	-0.39 (0.43)
Used EBT system		-3.85** (0.28)
R ²	0.03	0.28

Source: Late Demonstration respondents (N=558).

Statistical significance: *, P < 0.05; **, P < 0.01; ***, P < 0.005.

three percent. This is consistent with the analysis in Section 6.3, which showed little relationship between experiences with the EBT system and demographic characteristics. Since no particular group experienced much difficulty with the EBT System, which would have required trips to the welfare office or resulted in high opportunity costs, the costs of participation in the program are not likely to vary by demographic group. After adding the dummy variable to capture the effect of using the EBT system, the explained variation in monthly costs increases to 28 percent. The coefficient indicates that, on average, the cost to participants who used the EBT system was \$3.85 per month below the cost to coupon users. Thus, the observed differences in the costs of using the EBT and ATP systems can be attributed to the systems themselves, and not to the characteristics of the recipients. This adjusted estimate is slightly higher than the estimate derived by the comparison of means (\$3.53), and confirms the EBT system's effect in reducing participation costs.

APPENDIX VII

APPENDIX VII-A

ACH ORIGATION COSTS

American Bank and Trust conducted a detailed cost analysis of its Automated Clearing House (ACH) functions in September 1985. All direct costs were identified, and overhead was allocated in accordance with the bank's cost-accounting policies. The fully allocated costs were then divided by the total volume of ACH transactions originated and received by AB&T to yield a cost per transaction. These costs are shown below.

<u>Expense Category^a</u>	<u>Item Cost</u>
Data Processing (Including PIPS ACH Software Amortization and Maintenance)	\$0.02173
Federal Reserve and ACH Association Charges	0.01119
Microfilm of Input and Output	0.00182
Mohawk Data Transmission Expense	0.00534
Item Processing Function Expenses	0.00016
Business Accounting Services (Internal Bank Cost Centers)	<u>0.05501</u>
TOTAL	\$0.09525

^aIncludes all general overhead allocations

We used these figures as the basis for estimating AB&T's costs in originating EBT payments through the ACH, with one adjustment. The second figure above (Federal Reserve and ACH Association charges) is currently averaged across both ACH origination and ACH receipt activities. AB&T pays a fee to originate, but not to receive, transmissions. Thus the figure understates the cost of EBT payment origination.

The Federal Reserve Bank charges an ACH origination fee that includes the following elements relevant to the EBT origination:

Charge per file transmitted	\$1.00
Charge per payment in a file	0.01
Surcharge per payment for night cycle processing	0.03

Because EBT payments were submitted for the night cycle, the fee was \$0.04 per payment, plus \$1 per file. Interviews indicated that the typical EBT ACH file contained about 50 payments, which amounts to \$0.02 per payment.

The total charge per payment is thus estimated at \$0.06. Substituting this charge in the table above, we estimate AB&T's total cost per EBT ACH payment as \$0.14406.

The EBT Center generated and submitted to AB&T an average of 1,842 payment entries per month, for an average EBT benefit value of \$387,290. AB&T stripped from the payment file those entries for retailers with AB&T accounts, and sent the remainder through the ACH. Assuming a 21-banking day month and an average of 50 entries per ACH file, 1,050 of the 1,842 payment entries (57 percent) went through the ACH system.

AB&T's estimated origination cost is thus \$151.26 per month ($1050 \times \0.14406). This amounts to \$0.39 per \$1000 in EBT benefits redeemed. If all payments had been sent through the ACH system, the cost would have been \$0.69 per \$1000.

For payments that AB&T posted directly to its own merchant accounts, it is reasonable to assume that the cost is equal to the ACH function cost less the ACH fee. Thus we estimate this cost as \$0.08406 per payment ($\$0.14406 - \0.06), or \$0.40 per \$1000 of benefits. This is also our estimate of the cost of receiving an ACH transmission and posting it to an account.

Compensation to AB&T was based on a monthly fee per wire transfer (\$5.50) and per non-AB&T merchant account on the EBT files (\$5). We assume that 57 percent of the average of 145 accounts on the system--or 83 accounts--are not AB&T accounts (this follows from the earlier estimate of 50 entries per ACH file). Our estimate of compensation is thus 83 accounts times \$5, plus 21 wire transfers times \$5.50, or \$415 plus \$116, for a total of \$531 per month.